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Volume 6.—No. 1.

MILWAUKEE, NOVEMBER, 1878.

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AN EXPERIMENT WITH PEARL MILLET.

BY PETER HENDERSON.

Pearl Millet has been cultivated for some years as a forage plant in some of the Southern States, as "African Cane," "Egyptian Millet," "Japan Millet," and in some places as "Horse Millet," but little was known of it at the North before last year, and then only in such small quantities as to hardly allow of a fair trial. From what we saw of it in 1877, we determined to give it a thorough trial this season. A piece of good strong loamy ground was prepared as if for a beet or turnip crop, by manuring with stable-manure at the rate of 10 tons to the acre, plowing 10 inches deep, and thoroughly harrowing. The Millet was then sown in drill 18 inches apart, at the rate of 8 quarts to the acre. We sowed on the 15th of May, about the date that we plant corn; in 12 days the plants were up so that a cultivator could be run between the rows, after which no further culture was necessary, for the growth became so rapid and luxuriant as to crowd down every weed that attempted to get a foothold. The first cutting was made July 1st—45 days after sowing; it was then 7 feet high, covering the whole ground, and the crop, cut 3 inches above the ground, weighed, green, at the rate of 30 tons per acre; this, when dried, gave 6½ tons per acre as hay. After cutting, a second growth started, and was cut August 15th—45 days from time of the first cutting—it's height was 9 feet; it weighed this time at the rate of 55 tons to the acre, green, and 8 tons dried. The third crop started as rapidly as the second, but the cool September nights lessened its tropical luxuriance, so that this crop, which was cut on October 1st, only weighed 10 tons green, and 1½ tons dried. The growth was simply enormous, thus: 1st crop in 45 days, gave 30 tons green, or 6½ tons dry; 2d crop in 45 days, gave 55 tons green, or 8 tons dry; 3d crop in 45 days, gave 10 tons green, or 1½ tons dry. The aggregate weight being 95 tons of green fodder in 135 days from date of sowing, and 16 tons when dried to hay. This exceeds the clover meadows of Mid-Lothian, which, when irrigated by the sewerage from the City of Edinburgh, and cut every four weeks, gave an aggregate of 75 tons of green clover per acre. There is little doubt Pearl Millet is equally as nutritious as corn-fodder, which it resembles even more than it does any of the other Millets. We found that all our horses and cattle ate it greedily, whether green or dry. If sowing in drills is not practicable, it may be sown broadcast, using double the quantity of seed—say 16 quarts per acre. The ground should be smoothed by the harrow, and again lightly harrowed after sowing; if rolled after harrowing, all the better. I know of no farm crop that will better repay high manuring, but so great is its luxuriance that it will produce a better crop without manure than any other plant I know of. In those parts of the Southern States where hay cannot be raised, this is a substitute of the easiest culture, and being of tropical origin, it will luxuriate in their long hot summers; even though our Northern seasons may be too short to mature the seeds, our experiments in New Jersey this summer show what abundant crops may be expected if the similar conditions are secured. Pearl Millet as a fodder-plant presents a new feature in our agriculture, and I feel sure that within ten years we shall wonder how we ever got on without it.—*American Agriculturist.*

LESSONS FROM THE FEVER.

There is a strong corroboration of the impression, which seems nearly universal in the South, that the rapidly approaching cold weather is already bringing with it healing, and the telegraphic reports are already beginning to impute the blame of the severity of the epidemic to the proper causes. In New Or-

leans alone, during the ninety-seven days of the prevalence of the scourge, there have been 12,426 cases, 3,775 of which have been fatal, and New Orleans has been the gateway through which the malady has spread over the immediate neighborhood, and attacked the cities and towns higher up the river. The truth of what is now said by many has long been apparent to all who cared to trace results to their causes; but while the ravages were so horrible, with no speedy prospect of their abatement, there were but few whose hearts were stern enough to permit a more than passing allusion to the underlying facts. Now, however, that the winds are colder and frost is settling down upon the land to kill the germs of the disease, it is not to soon to speak out. If all with common consent should wait until the fever had snatched its last victim and health were re-established all over the South, half the force of the opportunity would be lost, for it is natural to tens of thousands to forget nothing so quickly as the incidents of a period of calamity, and to neglect nothing so readily as the proper means for preventing its recurrence. But these last the people of the South must think of if they are brought directly to their notice before the pestilence has ceased.

It is, therefore, proper to tell the authorities and people of New Orleans that in the past they have disregarded the proper performance of a plain and obvious duty. Yellow fever always prevails more or less virulently every summer at Havana, and New Orleans is the port through which by far the greater portion of our business is transacted with Cuba. Havana is a badly-drained and mismanaged municipality, with whose improvement, in the absence of another treaty with Spain, we can have but little, if anything, to do, beyond offering friendly advice.

But for the condition of New Orleans American citizens are immediately responsible, and its drainage and the evil condition of some of its districts seem to have been allowed to remain in nearly as pestiferous a state as those of Havana itself. Of late years this has been going on from bad to worse, and the accumulations of the miasmatic dirt of a long-continued term have, as a matter of course, created a vast supply of material adding virulence to the poison, contaminating the air, and weakening the constitutions of the inhabitants by its foul effluvia. The telegraphic reports published yesterday brought strongly confirmatory evidence of these facts, at which physicians, during the last two or three months, after it was too late, have been hinting delicately. It is plain that refuse, including no doubt all sorts of garbage, has been allowed to rot and grow fetid in the resident sections of the town, and the necessary result has been abundantly manifest. The cleansing process has just begun after the useless sacrifice of many valuable lives; but for the future the people of the smitten cities, and all those which are even remotely liable to the epidemic should take to heart and practice the wise maxim, that prevention is better than cure.

It may be some time yet before the report of the Commission of Medical Experts is given to the world, but nothing can be said capable of refuting the dicta of plain common sense, or persuading any one who takes the trouble to think that plenty of good water and pure air, which are the great fruits of urban cleanliness and good government, will not in time, if not wholly eradicate, at any rate almost incalculably mitigate the severity of the affliction.

It is by these very means that Galveston has been protected and cholera so effectually guarded against in the best administered communities of both the new and the old world that, were it not for the irrefragable documentary evidence of the past, few would be able to realize the horrible destruction it once wrought, not merely in its native home on

the banks of the Ganges, but also in civilized Europe and America. Small-pox, also, is another instance of the control of a disease by effective legislation wherever it has been vigorously carried out. Typhus fever is another. By a system of proper drainage it has been entirely driven out from many of the haunts it once made its own. All the experience of the past, and all analogy, prove that similar beneficial results will flow from a wise, strenuous and persistent adherence to the laws of hygiene in the case of yellow fever also. All the Southern cities, and New Orleans especially from its position, owe it as the most sacred duty to themselves and the country at large, to insist upon such proper precautions for the future as the experience of the past may have suggested or the forthcoming report may advise. Among these it may possibly be found that a more rigid system of inspecting vessels arriving from Cuba during the unhealthy season may be recommended; but the first duty of the citizens lies at their very door, and as soon as possible after the frost has really set in the cleansing process and the necessary improvements, both above the ground and under its surface, should be pushed on so rapidly that the spring may see their entire completion.—*St. Louis Globe Dem.*

THE ARKANSAS VALLEY.

The Soil and Climate Attractive to Settlers—Some Facts About the Population, Crops and Markets—The Lands of the Government and Railroads.

[Correspondence of the Milwaukee Sentinel.]

MILWAUKEE, Oct. 28.—I have recently made a trip to the much talked of State of Kansas, and since my return many inquiries have been addressed to me in regard to that section of the country, but I find it impossible to answer each individual query, and can only do so through that reliable medium of general intelligence—*The Sentinel*. So I should like you to publish, for the benefit of such as are interested in the subject, the following statement of facts, as I have found them:

I had, on previous trips, carefully examined the north half and the eastern portion of the State of Kansas, but on this trip I confined my observations to that portion lying along the line of the Santa Fe Railway, from Topeka, westward to Kinsley, a distance of 300 miles—the last 150 miles being in the great valley of the Arkansas River.

This river is a rapid stream about twice as broad as the Milwaukee River, and is crossed by substantial bridges at all the principal towns on its banks. The valley varies in width from thirty to fifty miles, and more than nine-tenths of it can be ploughed and cultivated. The surface of the country is rolling prairie. The soil is a black, sandy loam, apparently very rich, as will be seen further on, and varying from three to ten feet in depth. It holds moisture remarkably well. At the time of my visit, there had been no rain in Edwards county for four weeks, but on turning up the soil with a spade to the depth of six inches in a dozen different localities, on cultivated lands, I invariably found the ground at that depth moist and in fine condition. There seems to be just enough sand in the soil to render it porous, easily worked, retentive of moisture and quick to yield returns. There is none of that sticky character in the soil, when wet, which is so prominent a feature in the prairie lands of Wisconsin and Illinois, and as a consequence they have the finest natural roads in the world—hard, free from sand, dust and mud at all seasons of the year.

*The Climate.*—The climate is subject to extremes of heat and cold, the same as in Wisconsin, but the extremes are not so great. The warm weather of summer continues longer there than here, but the hottest days are always followed by cool nights which permit sleep, and render the hot days endurable.

The extremes are about 102 degrees in the shade on the hottest days, and 8 degrees below zero on the coldest in Edwards county. The average temperature of summer being about 7 degrees, and of winter about 25 degrees warmer than at Milwaukee. The climate is said to be favorable for persons with weak lungs and those troubled with asthma and catarrh. The air is very pure and apparently free from malaria. Good soft water, in abundance, can be found at a depth varying from twelve to thirty-eight feet. Taxes are about 1 per cent on the actual value of property. The prices for all store goods are about as at Milwaukee. Agricultural implements and lumber about one-fourth higher. Farm produce sells for about one-fourth less than at Milwaukee.

*The Population.*—The people are largely American; Illinois and Wisconsin furnishing the largest number. The foreigners are principally German. The census of 1860 placed the population of the State at 107,000. In 1870, there were 364,000; in 1875, 528,000. There are now 800,000. This rapidity in growth is simply wonderful, and nothing but the fine soil, climate and natural advantages of the State could induce such an influx of people.

*The Crops.*—In 1874 Kansas, like Nebraska, Dakota, Iowa, and part of Wisconsin, was devastated by the locusts, but many of the fields were resown that year and yielded well, and the immense crops of wheat and other grains that have been grown in the valley each year since, have restored entire confidence to the strangers. The average yields of wheat for the whole State the present year is placed at twenty-six bushels per acre, the average in the valley being about thirty bushels per acre. The rich, porous soil, retentive of moisture, the even distribution of rainfall during the growing months, the warm days and cool nights of the Arkansas valley, alone can account for so large a yield.

*Government and Railroad Lands.*—Cattle, sheep and hogs are grown in large numbers. There is about 200,000 acres of vacant Government land in Rice, Barton, Pratt, Edwards and Hodgeman counties, subject to homestead and pre-emption entry, or to be taken up under the timber culture laws, the latter requiring the cultivation of ten acres of forest trees. Large quantities of railroad lands are yet unsold, ranging in price from \$2 to \$10 per acre. The cheapest—and in the opinion of many, the best—are the lands lying south of the Arkansas river.

There is no timber in the valley. Coal of good quality at \$5 per ton is used for fuel. Building stone is abundant in some localities. Brick can be had at \$8 per thousand.

The railroad companies, those corporations without souls to be damned, will carry a car load of household goods for \$100, or a car load of lumber for \$140 from Milwaukee to Kinsley. Kinsley is the county seat of Edwards county, contains about 1,000 inhabitants, and has grown up in about two years. It has a large number of business houses, one of which as I was credibly informed, did a business last year of \$250,000 in general merchandise, agricultural implements and lumber. It has a good school building as Milwaukee possessed when she had a population of 100,000.

If any desire more explicit information, and will take the trouble to call on me personally, I shall be glad to see them. I have no lands for sale, and am interested only in the small tract which I have located and on which I expect to work and wait with an ever present hope—that health broken by sedentary habits and over work in doors, may return to make life endurable. GALEN B. SEAMAN.

Edw. P. Allis & Co have closed a contract with the Reliance Mills, of Milwaukee, for a 28x48 improved Corlies cylinder and regulator, on a guarantee of 33½ per cent. saving over an Eastern-made engine.



## UNITED STATES MILLER.

E. HARRISON CAWKER, EDITOR.

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MILWAUKEE, NOVEMBER, 1878.

We send out monthly a large number of sample copies of THE UNITED STATES MILLER to millers who are not subscribers. We wish them to consider the receipt of a sample copy as a cordial invitation to them to become regular subscribers. We are working our best for the milling interest of this country, and we think it no more than fair that our milling friends should help the cause along by liberal subscriptions. Send us One Dollar in money or stamps, and we will send THE MILLER to you for one year.

CAWKER'S Saw and Planing Mill Directory of the United States and Canada is now ready for delivery. All dealers in machinery used in this class of establishment should order at once. Only 125 copies have been printed. The book is printed in clear, plain type, on heavy paper, and bound substantially in cloth. It contains between 11,000 and 12,000 names. Price, Five Dollars per copy. Remit by registered letter, post office order, or draft on New York.

CAWKER'S Millers' Address Book, containing the names and postoffice addresses of the flour mill owners of the United States and Canada, should be in the hands of every dealer in supplies or machinery used in a flour mill. Since its publication a large number of names and post office addresses of mill owners have been added in the shape of supplementary sheets. We have already supplied many of the leading mill furnishing houses in the United States and some in Europe. The book will be sent together with supplementary sheets to any address in the United States, Canada or Europe, post paid on receipt of five dollars.

THE MILLER'S TEXT BOOK.—We have just been appointed the agent for this country for the sale of the above mentioned work which should be in the hands of every apprentice, journeyman, head miller and mill owner in this country. Its author, Mr. J. M'Lean, of Glasgow, Scotland, has been a miller for over 30 years and has traveled extensively through Europe, America and Australia, and has thoroughly studied the subject of milling. The MILLER'S TEXT BOOK is a standard work amongst millers in Great Britain and will be in this country now that it is brought before the milling public, and is so easily and cheaply obtained. A copy will be mailed to any address in the United States or Canada post-paid on receipt of sixty cents in cash or stamps. Address THE UNITED STATES MILLER, 62 Grand Opera House, Milwaukee, Wis.

HOPPIN in his last *Northwestern Miller* gives the public an article entitled "What Women Most Need." Well! he is a husband and a father, and, we suppose, ought to know.

We would call the attention of our readers to the late list of purchasers of the celebrated BECKER BUSH, published on our first page. No flour mill should be without it.

A PITHY TELEGRAM.—A few days ago the following telegram was published in our dailies:

KILBOURN CITY, Oct. 15.—O. C. Remington of Baraboo had a surgical operation performed on him for stone in the bladder. Funeral to-morrow.

MESSERS. John T. Noye & Son, the well-known mill furnishers, of Buffalo, N. Y., have ordered the belt tightener manufactured by Geo. Walker, of Hamburg, Erie Co., N. Y. It is the best in the market.

There are some eight or ten milling papers (so called) in these United States, all of which with charming unanimity style themselves "official organ of the Millers' National Association." And they each believe the legend, too, notwithstanding the National Association denies that it has such a thing as an organ.—*St. Louis Commercial Gazette*.

Ya-as. So we've heard.

THE new *Millers' National Magazine* of Chicago, has made its appearance. It is very handsomely printed,—in fact, nice enough for a lady's parlor. It is published quarterly, and will no doubt meet with liberal patronage. The subscription price is fifty cents per annum in advance—or seventy-five cents, if paid for at the end of the year. Send for it at once.

We produce 50 bushels of grain per head, estimating our population at 40,000,000, while Europe with a population of not quite 800,000,000, produces only 16 bushels per head.

It being estimated that the average consumption of grain per head is 15 bushels, we produce three times as much as we require, Russia not twice it wants, and Great Britain not much over one-fourth her requirement.

Oct. 30, the Chicago elevators contained 2,899,793 bushels of wheat; 905,566 bushels of corn; 831,281 bushels of oats; 109,884 bushels of rye, and 1,257,337 bushels of barley, making a grand total of 5,613,861 bushels, 5,736,599 bushels a week ago, and 1,831,619 bushels at this period last year.

Wichita, Kan., is in need of another railroad. The Secretary of the Board of Trade of that town, has written to the Secretary of the St. Louis Board of Trade, complaining of a wheat embargo, caused by an inability to get sufficient railroad transportation. The Secretary states that over six hundred wagons, loaded with grain, have been turned away because there was no storage capacity to be had. Railroad facilities are deficient, and another road or more cars are wanted.

The following is given as about the average: The number of seeds of wheat in a pound is 10,000. The number of seeds in one pound of oats is 30,000. The number of seeds in one pound of buckwheat is 25,000. The number of seeds in one pound of red clover is 249,000. The number of seeds in one pound of white clover is 688,400. A bushel of clover seed, sixty pounds, will contain 20,976,000 seeds, which, equally distributed over an acre, will give about three seeds to the square inch of ground.

## THE COCHRANE SUIT.

A telegram has been received by a gentleman in this city, interesting to those engaged in the milling business, in reference to the suit of Cochrane et al. vs. Vail, Shotwell & Co., of New York City, on the application of the plaintiff for an injunction. The matter has been before Judge Blatchford for some time, and the last news from the case is summed up in the following dispatch:

"Judge Blatchford drove the enemy from Court, and denounced them for seeking to make of him a Moot Court."—Dispatch dated Oct. 28th, 1878.

It has been stipulated between the parties in the St. Louis cases to try them in November or December.

Jno. A. Hafner, of Pittsburg, Pa., manufacturer of the celebrated Eureka Coil Spring and Automatic Release Friction Clutch, in a recent letter says: "I have constructed machinery at an expense of about \$1200, for the special purpose of weighing the power lost or utilized by different modes of driving. The dynamometer shows that when driven by gear and spring, the engine gives 5340 units of power; but when driven by belt, from periphery of flywheel, gives only 3040 units of power, which is 2300 units of power, or 43 per cent less, that is destroyed by cramping the motion of the flywheel (for when driving from periphery of flywheel the driven machinery has the leverage over it, and, when thus connected, can no more absorb and transmit the full force of a stroke to the centers than a man can deliver an effective blow when his sledge is impeded in its course), friction and slippage. When driven by gear and spring, the flywheel has a free and elastic movement, thus transmitting the surplus power from point of greatest efficiency to the dead points, or centre line of stroke, and the friction is reduced to a minimum.

A DRILL WHICH BORES SQUARE HOLES.—One of the novelties of the Paris exposition is a drill which bores square holes, the invention of Mr. Julius Hall, of London. The work is done too, says a correspondent of the *Scientific News*, in a way so simple and so easy that any one may prove the fact for himself. The invention has excited genuine astonishment among the mechanics gathered at the exposition. There is a constant crowd surrounding the inventor, watching him bore hole after hole square, and puzzling over the provokingly simple solution of the problem. All that is required is an ordinary hand drill stock. A stationary one with a chuck below for holding the work is used by the inventor; but he says a common brace will answer—"anything, in fact, will do that will properly hold the drill." The tool itself is the usual form of three-square drill—so that no special apparatus is required. Clamp or chuck this drill in its hold so that "it will wobble," that is the whole secret. Instead of making a round hole, as it will if tightly grasped, when loosely held it produces a square one; and, according to the inventor, it is immaterial whether the drill wobbles in the work or the work under the drill.

Packard & Co., of Covert, Mich., are converting one of their saw mills into a grist and planing mill.

## Correspondence.

## FROM PHILADELPHIA.

(Philadelphia letter from our own correspondent.)

PHILADELPHIA, Pa., Oct. 21st, 1878.—The fall has been marked by a very decided improvement in the industrial interests of Philadelphia and Pennsylvania. The awakening has not been confined to any one particular interest, but every industry has started up with new life and vigor, and the present situation—which is even better than that previous to the panic of 1873—does not seem to be spasmodic, but has, apparently, come to stay.

The iron, lumber, cotton and woolen manufacturing industries are especially in a very bright condition, and the prevailing prosperity bids fair to become still more encouraging as the season advances. The iron masters in the great Lehigh, Schuylkill, Susquehanna and Lackawanna regions are jubilant over the breaking up of their business, which has been in a rather demoralized and unprofitable state for several years past. The factories are well supplied with orders, have others in prospect, and have secured fair rates for the material ordered. Thousands of unemployed iron-workers have been put to work, and where, a few months since, destitution and misery existed, there is now plenty, comfort and happiness in the homes of the deserving workmen, who had been thrown out of employment by the unfortunate reverses in the business of their employers.

At this season of the year, in good times, there is always more or less activity in the cotton and woolen manufacturing establishments, but this year the situation is even more excellent and encouraging than at any other period in the history of the textile interest. The great works in the Kensington, Frankford, Germantown, Manayunk, Falls of Schuylkill and Bridesburg manufacturing districts are nearly all running on full time and forces, and the daily production of the various lines of fabrics designed for ornamentation and general use is quite large. From the assurance of their agents, the manufacturers have reasons to believe that the demand for their goods will be unusually heavy this fall and winter, and accordingly extra efforts are being made to meet the anticipated influx of business.

The flour manufacturing interest, which extends from Philadelphia to almost every section of the State, is also enjoying a portion of the good times, and the "dusty millers" and their assistants are industriously engaged in handling "the staff of life" to an extremely large extent. The several thousand flour mills scattered throughout the Keystone State have been grinding away at the hardest rate imaginable ever since the opening of fall. A flying trip of the correspondent of the UNITED STATES MILLER through the flour milling districts in the interior of Pennsylvania has illustrated the fact that all the millers are doing a fair business. Of course many of the worthy millers complain of the hardness of the times, but they all agree that there is a decided change for the better, and, if the prevailing easy situation continues for a little while, all apprehensions for the future will be dispelled. The Philadelphia flour men are all doing well. The principal flour milling establishments, those of Detwiler & Welsh, Col. Wm. B. Thomas & Co., Hartranft & Co., and Bennett & Co., are operating to their fullest extent, and are putting on the market large consignments of flour. Hartranft & Co. and Bennett & Co. are two of the oldest and best-known concerns in the State, and have won the widest celebrity for their manufactures. The weekly production of all these mills is much in excess of that for the same period last year, and it is anticipated that there will be a still further increase in the product in the early future, as parties are about contracting for large quantities of flour for the South American trade, and the Philadelphia flour men expect to get a portion of the orders.

The shipment of American milled flour from the port of Philadelphia has already reached considerable proportions, and, from the present indications, it looks very much as if Philadelphia is to outstrip all other cities in the East in the race for the Brazilian flour trade. The shipment of flour from this port to Brazil is now averaging from 700 to 1,700 barrels weekly. The schooner Mary E. Douglas, loaded, on the 15th October, with 3,000 barrels. This is the largest shipment that has yet been made by any one firm, but it is possible that just as soon as competition augments, larger shipments will be undertaken by the millers and shippers. The principal points to which the consignments are made are Para, Rio de Janeiro and Maraboa. From these places samples are sent to the interior of the country, and orders are filled from the consignments.

The flour that has so far been sent away is of the highest grade, and will stand the inspection that it is expected to undergo upon its arrival at the point of shipment. It is said that the agents of English millers, who are stationed in Brazil, have, through fear of the American flour gaining standing in the market, run down its merits, and, to explode their idea, the very best article that could be produced has been forwarded.

W. A. E.

## FROM JERSEYVILLE, ILLINOIS.

For the handling of wheat and grain Jerseyville has superior facilities. She has two large elevators and three flouring mills. The Jerseyville Elevator and Milling Company have the largest establishment in this section of country. Their building has

a capacity of 40,000 bushels. They ship from 100 to 125 cars per month. So well equipped are they that they can load a car with wheat in three minutes. This company make large shipments to mills throughout the State, selling to them on the track at this point. This company also own and control the First National Bank, which is one of the strongest and most popular banks in this part of the country.

E. Cockrell runs a large elevator and lumber yard and does a large and profitable business. His elevator was built in 1867, and has from the start been a paying concern. Mr. C. ships from six to ten cars of grain daily. Mr. C. also owns and runs an elevator of 12,000 capacity at Medora, Ill.

The City Mills, owned by Chas. Jacobs, are among the largest flouring mills in the county. This mill turns out seventy-five barrels of flour daily, of the finest quality. Mr. Jacobs is known all over the county as the "boon miller," and his work does not belie the reputation.

The Empire Mills are the oldest in the city and were established in 1858. The mills are owned by H. O. Goodrich, who is one of the fathers of Jerseyville. Their capacity is 100 barrels per day, and the flour made here is only of the best quality, and the popularity which it has is a sufficient testimony to its merits. Mr. G. is a popular citizen and was for five years Mayor of the city, and has been for years a member of the City Council.

The National Mill closes the list of Jerseyville's milling interests. The proprietor, Mr. Theo. Dodson, is a young man full of life and vim, and the people appreciate his efforts in their behalf by giving him their patronage. The mill turns out fifty barrels of flour daily, and a more popular brand is not found than the National Mills. The mill has all the new improvements for manufacturing only the best grades of flour, and Mr. Dodson shows himself to be one that is able to make a complete success of his work.—*St. Louis Post*.

## IMPORTANT TO MACHINERY DEALERS.

CAWKER'S SAW AND PLANING MILL DIRECTORY OF THE UNITED STATES AND CANADA, contains the names and post office addresses of the owners of Saw and Planing Mills in every State and Territory and Canada. The names of the post-offices are arranged alphabetically by States, and the Saw Mill Owners are separate from the Planing Mill Owners. Corrections made up to July 1, 1878. We believe the work to be as complete and correct as it is possible to get it. It is invaluable to dealers who wish to quickly place before the trade their catalogues, circulars, price lists, etc. The price of the work is Five Dollars, on receipt of which, with order, the work will be forwarded by mail, post-paid. Address all orders to E. HARRISON CAWKER, editor of the *United States Miller*, 62 Grand Opera House, Milwaukee, Wis.

## THE BEER SITUATION—THEN AND NOW.

O dot bully lager beer of eighteen fifty-nine,  
 It tasted awful good, and made you feel so fine;  
 You mide fill yourself chuck full, empty out and fill again,

Und got up in der morning mid out one bit von pain.  
 But now dot lager beer, although it looks quite nice,  
 Ish made von corn und barley, und dot confounded rice.  
 Und of you don't look out, und a bid too much you take,  
 You vill vake up in der morning mit a mity pig headache.

Some months ago the Lord Bishop of — came to this country on a visit to the Rev. Dr. —, of the Episcopal Church of New York. The Doctor instructed a colored boy in his service to knock at the bedroom door of the Lord Bishop early in the morning and say, "My Lord, the boy." Accordingly, the next morning, the boy, somewhat dazed by so much grandeur, knocked at the Bishop's door, who called out, "Who is there?" The boy responded, "The Lord, my boy."

## Special Business Notices.

Do you need a good Saw Gummer or Saw Tooth Swage? If so write to J. W. Mixer & Co., Templeton Mass. Agents wanted.

NOTICE.—Owing to the death of Mr. Edward Harrison, we take this method of informing you that the business will be continued until further notice, and that all orders will receive prompt attention. Letters should be directed to the "Estate of Edward Harrison," New Haven, Ct.

IMPORTANT NOTICE TO MILLERS.—The Richmond Mill Works and Richmond Mill Furnishing Works are wholly removed to Indianapolis, Ind., with all the former patterns, tools, and machinery, and those of the firm who formerly built up and established the reputation of this house; therefore, to save delay or miscarriage, all letters intended for this concern should be addressed with care to Nordyke & Marmon Co., Indianapolis, Ind.

THE MILLER'S TEXT BOOK.—By James M'Lean, of Glasgow, Scotland.—A descriptive and explanatory account of the various grains, machinery, and processes used in grain mills. The first clear and successful explanation of said processes ever printed. It treats on and explains all the newest and most improved modes of manufacturing wheat, oats, barley and peas, introducing the three latter mainly with the views of illustrating the principles at work in the proper manufacture of the first. Such as the various modes of storing, cleaning and grinding wheat, and the effects on their proper working with the Baker, showing conditions which must be observed to make flour equal to Hungarian. The effects of the different styles of working mill-stones, rollers and disintegrators contrasted. Also the different modes of separation, including gold sifling, the revolving crank sifter, the shaker, the wire cylinder, the silk reel, the best mode of working the silk reel. Vertical and horizontal air currents, the effects of air currents contrasted with sifting. Altogether explaining clearly well defined principles which govern proper grinding and dressing, where too often all is doubt and uncertainty. And although extensively circulated in Britain the last 12 months, none has yet ventured in print, to controvert its solution of the most difficult problems in the milling business. And being the production of a miller who has been over much of the United States, it can be easily understood by American millers. Price sixty cents, sent post paid. Address all orders to E. Harrison Cawker, Editor of THE UNITED STATES MILLER, No. 62 Grand Opera House, Milwaukee, Wis., who is sole agent for America.



## A NEW FUEL.

## Use of Petroleum in Producing Steam—The Results of the Discovery Upon the Manufacture of Iron.

(New York Correspondence.)

Mr. S. C. Salisbury, a mechanic, has been at work for twenty years on a plan to utilize petroleum for fuel in producing steam. He has hit it, and is in a fair way to make a fortune. It was tested in the Brooklyn Navy-yard on Saturday, and was found to work to the utmost satisfaction of the officers who inspected it. The furnaces were in full blast, but no smoke was visible. Great volumes of white steam rolled away from the pipe, but no coal was thrown upon the fire below. It had the look of an effect without a cause.

"The most wonderful sight I have ever seen," the veteran engineer Isherwood said. "It revolutionizes the iron and steel manufacture the world over," one of the largest iron men of the country exclaimed. "It opens a new era in glass manufacture. We shall soon have glass roofs on our houses and French plate will be as cheap as common window glass," said a large glassmaker.

The results were so extraordinary in the perfect combustion attained, in the intensity of heat quickly produced, in the enormous pressure of the super-heated steam, in the astonishing evaporation of water, in the freedom from dust, cinders, sulphur and all impurities, that these experts at once realized that a revolution in all departments where steam is used must occur immediately.

The fuel is made of the residue of petroleum and coal-tar, which is mixed to about the consistency of molasses. It is conducted from the barrel to the furnace by means of a small gas-pipe. At the end of this pipe as it enters into the door of the furnace is a funnel-shaped apparatus. As the fuel enters this funnel it comes in contact with a current of highly super-heated steam, which atomizes the liquid as that it leaves the machine. It induces the required amount of oxygen to enter and mix at the point of ignition. Thus the atomized fuel shoots, in a fierce but delicate spray, into the blazing furnace. The brick arches of the great furnaces are kept at a white heat, and a pure white flame flashes along the whole length, registering a heat of 5,000 degrees, melting pig-iron in ten minutes, and making liquid glass in two hours, instead of sixteen. All that there is to maintain this extraordinary heat is the light spray darting from the little furnace, which comes just within the door. "I can send this intense white flame from the Battery to Grace Church if I have a furnace arch that long," said the inventor.

The amazing scope of this new discovery may be estimated from its effects upon the oil trade alone. Mr. Salisbury says he is about to make a proposition to the producers and the United Pipe Lines for a permanent contract to take from them, at Pittsburgh, all of their surplus and all their distillate tar naphtha, at a price that will give the producers fully 50 per cent profit and also pay the pipe lines for piping it to Pittsburgh. The ocean steamship business will also feel the effect of this revolution in steam-producing fuel. Experiments already made show that in a single trip across the Atlantic a saving of about \$5,000 will be effected in freight-room alone, as the space now taken up for 800 tons of coal will be used for freight.

But the greatest achievements of the new system will be in iron-making. Said the leading representatives of this interest: "This is the grandest achievement of science in this age, and this inventor's income, even on very small royalties, will be greater than any living capitalist. With the mechanism, invented by Mr. Salisbury, a blast furnace of thirty tons per day will convert its liquid iron into blooms or ingots of wrought iron or steel at a cost so trifling that it enhances the value of pig metal 100 per cent."

## A FORTUNATE CITY.

A city, which has fuel and light without cost ought to make rapid progress in industrial enterprises. Such a city is East Liverpool, Ohio, of which the correspondent of the *Cleveland Leader* says:

The natural gas wells are situated in and around the city, and give it a continual supply of the finest light. The gas is almost as free as the air. It costs practically nothing and forms the illuminator and heater of the town. The city is lighted by it, and the street lamps blaze away at noonday as well as at midnight. It costs nothing to let them burn and it takes trouble to put them out. Its light is not the flickering mockery of poorly manufactured gas, but a flame which proximates in its brilliancy to that of the electric light. Almost the entire fuel used in the town is this gas. It is conducted into the grates and stoves in pipes, and by it all the cooking and heating is done. It is also used in furnishing steam power for many of the largest pottery and iron stone china manufacturing establishments, twenty-two of which are in operation and busily engaged, employing over 2000 hands, and which it is considered justly entitled East Liverpool to be designated as the "ceramic city" of America. Regarding the duration of the supply from these wells it is stated that the first well discovered now burns as brightly as when it was first opened, and for the last twenty years has never flagged in its brilliancy, and none of those now in operation have ever shown any signs of giving out. For years Liverpool used manufactured

gas, never dreaming of the rich supply that was wasting away daily under its feet. The poor quality of the manufactured product induced the opening of the first well in 1859. This well, which is 450 feet deep, has been furnishing fuel and light to several houses, producing the steam for a large engine, and burning pottery kilns for over twenty years.

Three young men arrested in New York for drunkenness and disorderly conduct explained that they were "members—hic—of Mr. Talmage's—hic—church, and we've just been round to the—hic—low concert sh'loons to see ef our beloved—hic—pastor tells 'er truth." "Ten dollars and costs," replied the hard hearted Magistrate.

A select party was highly entertained one evening by the precocious 4-year-old of the host. The youngster attracted universal attention by the singular movements of his elbow. His aunt resolved to ascertain what the little chap was up to, and in answer he said: "I'm cooking my elbow." "What are you crooking it for, Johnny?" "I want to get a nice little strawberry on my nose." "Why, Johnny, that won't make a strawberry." "Yes it will, aunty, 'cause nurse says papa wouldn't have a strawberry on his nose if he didn't cook his elbow so much, and I dea nurse knows."

M. Buchner, a French scientist, has discovered that a single drop of alcoholic extract of Campeachy wood, placed upon pure flour or bread, will cause a brownish yellow stain. If the flour contains alum, in the proportion of one or two per cent, the color will turn to a grayish blue or violet gray. With one-half per cent of alum the tint is reddish yellow, with a border of gray blue, and small blue spots can be discovered by examining it with a lens. One-fourth per cent of alum is the limit of reaction, when the blue border disappears, although the small spots are faintly discernible.

"THE CHINESE MUST GO"—There is a copper-colored, almond eyed son of Tartary in Gold Hill who must obey Kearney's injunction. About six months ago he bought 500 shares of Bodie stock at 40 cents a share, and when it reached \$53 he sold out, putting the entire capital in Sierra Nevada at \$9 a share. When this favorite was booming the other day he sold his stock on the street for \$190 a share. The coin thus obtained was immediately converted into United States bonds, and the Mongolian is now so rich that he has quit sawing wood and will not accept any kind of a situation less dignified than that of dishwasher in a first-class restaurant. Verily the agitator is right. "The Chinese must go."—*Gold Hill (Nev.) News*.

IMPROVE THE SEED WHEAT.—We may very well take the trouble to improve the varieties of wheat we have, and which we know to be good, so as to enlarge the yield and better the quality. The best attainable yield is somewhere about sixty bushels per acre, the best weight per bushel about sixty-six pounds. The best crops now grown in this country yield about forty bushels, and the best weight is not more than sixty to sixty-two pounds per bushel. Where such crops as these are grown it would not be difficult to reach a maximum product if we could add somewhat to the prolificness of the seed and increase its size and weight. But what shall be said as to those ordinary crops which reach but ten bushels per acre, and which have year by year grown less and less by neglecting to improve the seed. Here there is abundant room for the most certain improvement. There can be no doubt that better preparations of the soil and the use of good seed would result in immediate improvement. Then by selecting the best ears from each crop and sowing these upon soil still better prepared, the yield could gradually be brought up to a high, if not the highest point. Sixty bushels per acre, if not more, have been produced by one farmer, who has been patiently engaged for years in improving his grains by selecting the best each year and using the best methods of cultivation.

The Manufacturer and Builder calls the attention of manufacturers who cast heavy pieces of glass, and also of millers, to a recent German discovery, that the finest flour is produced by those millstones which have the most glassy texture and composition, and the consequent discovery that pieces of glass combined in the same way as the French burr, and similarly grooved on their surfaces, will grind better than the burr millstones. The consequence of this discovery has been the invention of the glass millstones now made by Messrs. Thom, and used in Germany and Borkendorf with great satisfaction, as it is found that they grind more easily and do not heat the flour as much as is the case with the French burr stone. In grinding grit they run perfectly cold. In order to make such stones, blocks of glass of from six to twelve inches wide are cast in a shape similar to the French burrs, but more regular and uniform. They are connected with cement in the same way, and dressed and furrow out with picks and pointed hammers; but it is believed that diamond-dressing machines might be profitably applied. It is said that these millstones, made of lumps of hard glass, do not wear away faster than the burr stones. Stones of four and a half feet in diameter, driven by six-horse power, ground two hundred and twenty pounds of flour an hour, and did it remaining cold. The grit is drier, looser, and the hull more thoroughly separated from the kernel than is the case with other stones.

## REVIEW OF THE MARKETS.

OFFICE OF J. H. DRAKE &amp; Co., 119 La Salle st., CHICAGO, Oct. 30, 1878.

WHEAT.—With an improved feeling in financial circles and stronger cables, the course of our market was upward during the early portion of the week, but since Wednesday we have had a dull and sagging market, notwithstanding the effort made by several strong parties to sustain it. Receipts have fallen off somewhat, but are still in excess of the demand, and our stock of the speculative grade has steadily accumulated until we have now fully 2,000,000 bushels in store for which there seems to be no demand, except from speculators who are buying to carry against November sales. The premium has been such as to make it a good investment, and the cash wheat has not been pressed upon the market. It is being largely cared for by provision men whose legitimate business is almost at a stand still just now, but who will find other use for their capital next month when the winter packing season begins in earnest. Of our daily receipts a smaller proportion has graded No. 3, and by reason of a lighter supply, the price has appreciated slightly, but there is still a difference of 11 cents per bushel between No. 2 and No. 3, which is too great and must be diminished, we think, by a shrinkage in the price of No. 2, before the latter will be taken freely for shipment. Present prices are certainly low and not very remunerative to the average farmer, but with speculation crippled in England, as it must be by the recent financial troubles, she is likely to buy only to supply present wants, and with a stock of nearly 17,500,000 bushels in sight in this country, and the season for cheap inland transportation nearly over, the outlook is not encouraging to holders here, and it appears to us that values must give way until a point is reached where capitalists will buy for investment, or farmers will stop selling.

Receipts at the Western primary markets for the week have been 2,069,000 bushels as compared with last week 2,545,000 bushels. Receipts at New York, Baltimore and Philadelphia, for the same time, were 2,566,000 bushels, while the exports from these ports foot up 1,140,000 bushels, showing a decrease which should tend to stiffen the English markets. Cash wheat @ 79½c. with intermediate charges 16c., would cost 95½c. alongside ship. With sail freights 5s 9d and 2 per cent commission on the currency value, would cost 38s. 9d. Cork for orders. Beerbohm's quotation, spring for prompt shipment 36s. @ 36s. 6d. or 7 to 8c. per bushel to the disfavor of shipments.

CORN has ruled very dull, and slightly in buyers' favor, since our last; receipts have been moderate and the shipping demand very light. A season of bad weather would doubtless delay receipts and give us temporarily higher prices, but aside from this we can see little to advance us. Most of our stock in store is held by one shipper who seems to be moving it only as storage expires and when freights are weak. There seems to be a general lacking of faith in the future as is shown by the discount on December and January. The former sold yesterday at 33c., and the latter at 32c.

PROVISIONS have ruled dull during the past week and at the close are several points lower than last Saturday's prices, caused by the daily very heavy receipts of hogs at all of the primary markets, as well as by Cincinnati's annual autumnal unloading of stock which they have persistently carried since last winter, through all of the ups and downs in the market, and are now forcing the property in order to make room for the winter work.

We had reason to expect the demand from the destitute fever district, upon the opening of trade, would be such as would lift prices and start speculation which has been so long dormant, but the "Grangers" seem determined to market their hogs regardless of cost, and until the weather is uniformly cold so as to start all of the pork houses in the Northwest, the same apathy we have so long experienced will continue; but with continuous freezing weather, we fancy, with the very low prices of hogs, country packers and those at the primary points will get up such a spirit of rivalry for them that in a very short time there will be a marked improvement in the price of hogs and a buoyant market for consumption and speculation. This time last year, foreign buyers had made contracts for November and December deliveries for from 40,000 to 50,000 boxes. This year the estimates for the same months are less than 50,000 boxes. From this we assume that they will only be the larger buyers for cash at our very low prices, evidence of which we now have, for the bulk of the past week's shipments are to the seaboard. We quote: D. S. cribs, loose, \$4.70 f. o. b.; shoulders, \$3.50; boxed, 30c. additional. Pork strips washed bright, packed in new salt, \$4.15.

B. H. Skoyles has sold a half interest in the Lee Mills to Mr. Lovell of the Cortland Mills, and he has leased the remaining half interest for three years. He will hereafter run both the Cortland and Lee mills. He is thoroughly refitting the mills and getting ready to do a first class merchant business. He has employed an English miller, now on his way to this country, to take charge. He has added a new run of stone, new purifier, bolting cloths, reels, etc.

A. F. Huntly, of Clear Lake, Minn., is putting a new run of burrs and new bolting cloth into his grist mill at Lexington, which he intends to make as good as any mill of its class in Minnesota.

## Items of Interest.

It is computed that Minnesota is capable of producing 700,000,000 bushels of wheat annually, and that the water power of Minneapolis alone can manufacture half of it into flour.

The first oil well was bored in 1859. There are now 10,000, and the amount of capital invested is \$100,000,000. Petroleum stands number four on our export list; cotton, flour and provisions only taking precedence in value.

The Samoan Islands are the great coconut producing islands of the world. The inhabited ones are nine in number, and they have a population of about 85,000. One German firm, dealing in the staples of those islands, does a business of \$5,000,000 a year. Pagopago is the harbor lately purchased by the United States.

The Commissioner of Agriculture has ordered from Japan a large number of bamboo shoots, which he intends to plant in this country, feeling convinced that their culture here could be made a success. He also expects a number of silk-worm eggs to arrive within a few weeks from Japan, and experiments will be made by the Department in the breeding of silk-worms.

A good paste, convenient for many purposes, is made as follows: Dissolve a piece of alum the size of a walnut in a pint of boiling water; to this add a couple of table-spoonfuls of flour made smooth in a little cold water, and a few drops of oil of cloves, and let the whole come to a boil. This paste put in a glass canning jar, or a well-cleaned blacking bottle, will keep for months.

SOWING SELECTED WHEAT.—W. J. F. tells the *Country Gentleman* that some of our best farmers intend to sow only four or five pecks of wheat per acre. Their idea is to grade the wheat, selecting all the large grains. This, they think, will give as good a seeding as two bushels sown in the usual way. Using some concentrated manure where the young plants can get it, will cause them to "stool" and cover the whole ground.

DAKOTA WHEAT.—The Chicago correspondent of the *N. Y. Bulletin* says: "The Territory of Dakota has this season produced the finest quality of No. 1 spring wheat, and upon lands which were always thought to be worthless. The extract we make from a letter just received from Fargo, Dakota, gives some very interesting facts upon this subject. Our correspondent says: 'The yield of wheat and barley throughout the entire Red River Valley has exceeded the expectations of the most sanguine; wheat yielding 20 and 35 bushels; barley, 60 bushels. Wheat is being put in the elevators and shipped as fast as cars can be obtained. There is a general blockade of freight and scarcity of cars all along the line of the Northern Pacific railroad.' In Traill county the yield is from 25 to 30 bushels per acre; half the crop will go into market at once, the balance will be held for higher prices."

A MODEST REQUEST ANSWERED.—The late sentimental ballad is entitled "Give me the boy of my childhood." Bless your soul, we'd do it in a minute, but—why, haven't you heard? Old Tadders closed out three mortgages on it in 1867 and 1868, and the next year it was sold for taxes, it was seized for debt the summer following, then your oldest brother claimed that it belonged to his wife, and brought suit in her name to recover, and before that was through they found an old flaw in the title and in trying to straighten that out it transpired that your grandfather had no Government patent on it at all, but had stolen it bodily from the Indians; and now two half-breeds have brought suit to recover the property as the heirs. The house was burned down about two years ago and the neighbors have used the fences for kindling wood; your wife's cousin is trying to get hold of the lot and your half-brother jumped the property one night, put a little shanty on the alley corner, and is now in possession. There doesn't seem to be much show for you, but you might file your papers, buy a lawyer and sail in. —*Burlington Hawkeye*.

AMERICAN WHEAT AND FLOUR IN FRANCE.—French millers are again complaining of the tax on foreign wheat imported into France. It seems that European wheats only pay a small duty of 60 cents per 100 kil, whilst others, such as American, have to pay the flag duty of 3 francs per 100 kil. Although the latter kind is the nearest in quality to French wheat, no remunerative use can be made of it in France, owing to this heavy tax. Belgium millers are much better off; they import American wheat, manufacture the flour, and send it to France, without paying duty, at prices 1s. to 1s. 6d. per sack less than French millers can afford to manufacture it. A miller, writing to the *Paris Echo Agricole*, describes this as an anomaly, and says that either the tax of 3 francs on American wheat ought to be abolished, or else American flour should be taxed to an equal extent. Further, it appears that Antwerp imports American barrel flour; this is put into sacks, loaded and designated by some brand, and sent into France without payment of duty. These matters are bitterly complained of by French millers, and certainly merit the attention of the French Government, especially during the present season, when so much will be imported by France.—*Corn Trade Journal*.

The Star mills at Waupaca, Wis., owned by G. L. Lord, have been thoroughly repaired. The millwright work was done by J. Sipes, and is first class.



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MILWAUKEE, NOVEMBER, 1878.

A. MILLOT, of Zurich, Switzerland, has invented a machine for separating garlic from grain.

**AMERICAN EXPORT OF AGRICULTURAL MACHINERY.**—A report of the Bureau of Statistics shows that in the year ending June 30, 1878, the exports of mowers and reapers amounted to 10,896, valued at \$1,018,916. Of plows and cultivators there were exported 20,710, valued at \$154,977. Of all other agricultural implements and tools there was exported \$1,379,467 worth. Taking all the exports grouped under the head of agricultural implements, the gain was nearly fifty per cent. as compared with the same for 1877.

A writer in the London *Times* asserts that, by the practice of shoeing horses, we diminish the sureness of the animal's feet, and foster a 1 kinds of splints and other diseases. He maintains that any horse, even one accustomed to shoes, would very soon go more easily in every way on our hardest roads, and with far less liability to slipping and disease, unshod, than he now does when shod with iron. All that is necessary is to "keep the edges of the hoof slightly rounded off with a rasp, to prevent the raveling-up of the edges."

The Halifax award of \$5,000,000 for damage to the Canadian fisheries has not been paid, and it is doubtful if the money will change hands until further light is thrown upon the subject. It is now claimed at Washington, by those who have been examining the subject, that the British bill of particulars, as it was submitted, only entitled the Canadians to \$120,000 a year for ten years, which would amount to but \$1,200,000, instead of the amount awarded. It is further claimed that there is an offset to the Canadian claim for special duties on fish and fish-oil remitted by the United States to Canada, amounting to \$3,000,000 in the ten years covered by the award. This would entitle the United States to \$1,000,000 from Great Britain, which would be far more comfortable than the award as it now stands.

The report of the official investigators of the City of Glasgow Bank shows the condition of that bankrupt institution to be worse than at first reported. The most damaging feature of the report is the evidence showing the frauds practiced in reporting vast amounts of bullion in the vaults of the bank, when they were really almost empty, and in understating the amount of loans outstanding. Among the "available assets" reported by the Directors was £7,345,367 in bad debts. The total loss is over \$30,000,000. A call for \$2,500 per share will soon be issued, and it is thought that not more than half the shareholders will be able to meet their obligations. There is some comfort in knowing that the mismanaging officials are in the hands of the law, and almost certain to receive well-deserved punishment.

While the older States are complaining of hard times and small profits, the Territories seem to flourish with marked vigor; Montana, away in the far north, sitting astride of the Rocky Mountains, is rapidly growing in population and material

wealth. Heretofore mining has been the chief industry, but farmers have been flocking in of late years, and it is found that agriculture pays even better than gold-digging. The wheat crop ran as high as sixty bushels to the acre in many of the fertile valleys this year, and the stock raised is said to surpass in excellence the best specimens offered by Iowa, Missouri and Illinois. It seems to be an excellent place for the banking business, as the First National Bank of Helena, the capital of the Territory, has just reported a net profit for the year of \$39,540 on a paid-up capital of \$100,000. This is doing well enough to tempt other capital to that country. It is said that there has hardly been a failure in the Territory in three years.

Good petroleum (kerosene), according to Prof. J. Lawrence Smith, should have the following characteristics: 1. The color should be white or light yellow, with a blue reflection. 2. The odor should be faint and not disagreeable. 3. The specific gravity, at 60 deg. Fahr., ought not to be below 0.792 nor above 0.84. 4. When mixed with an equal volume of sulphuric acid of the density of 1.53, the color ought not to become darker, but lighter. A petroleum that satisfies all these conditions, and possesses the proper flashing-point may be regarded as pure and safe.

A very ingenious machine, invented by James H. Williams, was exhibited this fall at a Mechanic's Fair in Boston, viz., a machine capable of indicating, six to eight times per minute, the superficial area of surfaces, however irregular, not exceeding twenty-five square feet. The machine can, for instance, compute in less than ten seconds the square contents of a circle without reference to mathematical rules. It is certain to find practical application in many departments of trade. It is specially of use to leather dealers and manufacturers for measuring exactly the superficial area of hides and skins.

First scientific party (of the name of Richard A. Proctor, with his telescope)—There is a steaple five miles off; I can see a fly walking on it. Second scientific gentleman (called Prof. Hughes, with his microphone)—I can't see him, but I can hear him walk. Third scientific person (named Edison, with his carbon thermopile)—I can measure the amount of heat produced by the friction of his movement. And, producing a phonograph from his pocket, by attaching this machine to your microphone, I can preserve and reproduce the noise of his walking, so that people can hear him walk a thousand years hence.

**A GENEROUS LITTLE DARLING.**—The *Independent* says: "I'm glad to say that our child is a generous little body. The other day her grandfather gave her a cent to buy herself some candy. As she was going out she discovered a little beggar boy on the front steps. She stopped, and looked first at him, then at her cent; then looked down on the ground, apparently lost in thought. Finally, with the sweetest smile on her beautiful face, she stepped up to the forlorn child, and, laying her hand on his shoulder, said, in a gentle tone, 'Here, little boy, take this cent and go and buy yourself a suit of clothes and some dinner.'"

**COMMERCE WITH SIBERIA.**—We had in our last issue the pleasure of informing our readers that the Neptune, Captain Rasmussen, belonging to Helsingor had arrived at Hammerfest from the mouth of the Obi with a cargo of wheat, and we now learn that not only has the screw steamer Fraser, Captain Nilsson, arrived at the same place loaded with a full cargo of grain and tallow, put on board at a place called Dudinsky, situated about 450 miles from the mouth of the Jenisej River, but that also the sailing ship Express, Captain Gundersen, belonging to Mr. Astrup, of Stockholm, has arrived with a similar cargo loaded at the same place. As the Express is a good-sized ship, the fact of her being able to load at such a distance from the mouth of the Jenisej River, and afterwards to sail across the Carian Sea, is sufficient demonstration that the route to the Jenisej is commercially practicable; a fact of which we should imagine our merchants will not be the last to take advantage of. The Fraser and the Express, as we mentioned some time ago, accompanied Professor Nordenkiöld to the mouth of the Jenisej River, on his expedition to find the Northeast Passage, etc. After discharging their cargoes of coal, etc., to the Vega and Lena (which two vessels left the Jenisej for the East on the 10th of September) at the mouth of the Jenisej, they continued their passage up the river to the point mentioned. From Dudinsky to Hammerfest the voyage occupied 15 days. The foregoing facts seem to suggest that it would be far better for our own countrymen, instead of wasting their energies on impracticable attempts to reach the North Pole, to try something likely to be of service to mankind in general in the way of geographical discovery. Professor Nordenkiöld has informed Mr. Dickson that good prospects exist

for the expedition getting to the goal, as the great enemy to be feared, ice, was conspicuous by its absence on the way to the Jenisej.—*Timber Trades Journal, England.*

## THE GRASSHOPPER NO LONGER FEARED.

BY PROF. S. AUGHEY, UNIVERSITY OF NEBRASKA.

It is well known in the West that during the winter and spring of 1877, I predicted that that season would be the last of the locust visitations for many years. The United States Entomological Commission entertained the same opinion. On the 16th of June, 1877, I predicted that that season would be the last of the locust visitations for many years. The United States Entomological Commission entertained the same opinion. On the 16th of June, 1877, Prof. C. Thomas and myself, in a report to the Governor, which was published at the time, used the following language: " \* \* \* We consider the danger from the young, which have hatched out this season in Nebraska, over, and that this part of the problem is solved. We also believe that the long series of visitations has come to a close. There may be, and doubtless will be, at irregular periods, visitations by migrating swarms, but it is not at all likely that the present generation will witness another such a series as that which has just passed." The predictions made at that time were singularly verified for that year, and have been for this. Our conclusions were based on facts that we had learned about the natural history of the locust, which have stood, and no doubt will stand, the tests of time. There need, therefore, be no fears of another series of visitations from these insects. Even if they should come again in the distant future, they cannot hereafter do the damage that characterized their last visitations. There will be then such a large amount of produce in the State, owing to the greatly increased area cultivated, that locusts will not be able to make much, if any, impression on the crops. Besides, the people have learned how to contend against them. They know now how to meet this enemy as it appears in spring, and it has lost all its terror to them, especially to those who were here during the spring of 1877.

## BACK LASH.

## Its Causes and Remedy.

(Read by A. W. Foster, of Pittsburgh, Pa., before the Iowa Miller's Association.)

A great deal has been said and written in regard to backlash, its cause and remedy. The main cause in grist mills is easily traced to the engine, when we examine into its construction, and the principle on which it depends for changing the reciprocating into a rotary motion. The crank receives the piston pressure, (which is anything but regular) varying from twenty to one hundred per cent. twice in each stroke, or four times in each revolution of the crank, and frequently pulling in the wrong direction, at the latter part of the stroke. Some of the irregularity is due to the "Cut-off," but most of it to cramped opening, badly proportioned valves, and eccentric in the wrong place. The crank depends not only on this constantly changing power, for its rotary motion, but on a more constantly changing speed of piston, which is nothing at the beginning, and from two to six hundred feet per minute at the middle of stroke, falling off again to nothing at the end, and as the power depends on the pressure multiplied by the speed of the piston, it is easily seen how very irregular the power must be, when it is the result of such a jumble of causes; and the motion dependent on such must be as irregular as the causes, unless we have a reservoir in which to pour the surplus ready to give it out again when and in such quantities as a constant speed may require. This reservoir is partially furnished by the fly wheel, which if heavy enough and run at proper speed makes the rotary a tolerably but by no means perfect motion, for in many mills with good engines and fly wheels, you may hear the rumbling and clanking of the wheels, as though complaining of the stupidity of the engineer who designed, and the owner who permitted, the constant quarrel between the honest old burr, who wants to go steady on about his business, and its driver, but which is jerked back then banged ahead by the impulsive spurts of the engine. A good many apply a belt to the spindle to overcome this trouble, but this merely changes the audible to a silent sawing backlash, with the result that the engine pulls on the burr, while the crank is at right angles, and the burr returns the compliment when the crank is on centers, and the engine helpless. From experiments made in

England, in 1863, it was found that even under the most favorable circumstances, about two revolutions per hundred were lost by slipping of the belt.

Another cause of backlash (not only confined to steam only, but also existing in almost every water mill,) is to be found in the wheels, some of which are cast from crooked patterns, many of the teeth being patched in the sand, the pattern being so out of shape that it will not leave the mould without taking some of the teeth with it; and again, from wheels being bored out of center, the slightest imperfection of the gearing, although nearly imperceptible, being detrimental to uniform working motion. But the grand cause is an irregular motion, and as no way has been discovered to give regular speed to the engine, and the tendency of the stone being to keep a regular motion, the most direct, and probably the only way to stop this quarrel between the contending parties, and quiet the grumbling of the wheels, is to make another reservoir within easy access of the stone, so that any surplus power hurled at the stone by the engine, can be stored away, to be drawn upon when the motion is not so generous. The most reliable, compact, and in the long run cheapest, reservoir, is a good and durable spring on the spindle of the burr, so proportioned that its elasticity is great enough to overcome all irregularities, and maintain a constant elastic pressure on the burr. This will, aside from improving the working capacity, also save a great deal of wear and tear on the machinery, and utilize all the power killed by the causes stated above, which is a greater per cent. than many persons are aware of. There are about a dozen kinds of backlash springs patented, and as many that are not, but as it is not my intention to endorse, or even mention, any particular make of spring, writing, as I do, for the general benefit of the milling community, I would merely say that in this, as in many other things, the best is the cheapest in the long run, even should the original cost be four-fold.

**THE HINDOO MARRIAGE.**—Among the Hindoos early marriages are the rule. By the time a boy of good family has reached the age of 14 or 15, a wife has been selected for him, usually a year or two younger than himself. Very possible he has never seen her until the marriage ceremony is about to be performed. At the wedding both families lay themselves out to make the utmost possible display. Relatives, friends and guests are gathered in the house of the bride's father. Clad in her richest attire, the girl kneels on a slight platform covered with a rich tissue, the boy sitting cross-legged opposite her. The bride's father raises her hand over a vase filled with the holy water of the Ganges, and places her hand in that of the bridegroom, who puts the ring on her finger, amid the prayers of the Brahmins. This is the essential part of the ceremony, which makes them husband and wife. The genealogy of the husband is then formally read, and the stipulated dowry is paid over to him. After this the festivities begin, and are kept up for several days.

**SAGACITY OF THE BEAVER.**—A Mississippi correspondent of *Chamber's Journal* recounts several interesting instances of the sagacity of the beaver, and of the readiness with which that animal grows accustomed to the presence of man. At a place near this correspondent's residence a railroad crosses some wet, springy ground, where there used to be several beaver dams. The line of embankment supplied the place of these dams, and the beavers, taking the good the gods provided, worked no more on their own dams, but enjoyed the pond of four or five acres which the embankment had made for them. A year or two since, the railway-workmen undertook to put a culvert through the embankment and drain the pond, which, after running freely for a few days, and nearly emptying the pond, suddenly stopped one night; the flow had been arrested by the beavers. The men opened it again, but once more it was stopped up. This went on for some time. As the men passed that way they would open the entrance to the culvert, and at night the beavers would shut it up. At length, finding that closing at the entrance, where their work could so easily be broken down, did no good, the beavers moved their dam to the middle of the culvert, which was some forty feet long, out of the reach of the poles used to poke it down. Here was a community of beavers working with express trains thundering over their heads.

Dr. Babcock, inventor of the fire-extinguisher bearing his name, is a drunken outcast in Oakland, Cal. He was once moderately wealthy.



T H H

# Cochrane Ring

TRY A NEW DODGE!

## George T. Smith

Thinks that

### ANOTHER PURIFIER

Is a much

## BETTER ONE

Than his own, and, with the aid of the Cochrane tribe of leeches, and the expenditure of some

Thousands of Dollars,

Makes the attempt to

## CAPTURE the PATENT

And in this makes a virtual acknowledgment of the inferiority of his Purifier.

Fighting against odds (for TRUTH was on the other side) he is beaten: appeals the case again and again with the same result, and finally appeals to the last tribunal AND FAILS.

Poor Ring!!

Poor George!!!

Poor Cochrane!!!

Weep and wail together, for your efforts to get a good Purifier to take the place of the big, clumsy thing which is now furnished by the Ring have been, alas! unavailing. You knew it would require

LESS CARE,

LESS ROOM,

LESS POWER,

And that it would do more and

## Better Work

Than any other Purifier in the world, and you wanted it.

## Read the History.

In the fall of 1873 one Milford Harmon claimed to have invented a Middlings Purifier and shortly thereafter applied for a patent. Failing to pay the final fee in the time required by law, his application lay in the archives of the Patent Office neglected until within a few days of the time when it would be no longer possible to revive it, when, according to the testimony of Harmon, it was assigned to George T. Smith. Among the devices shown in the Harmon Purifier, was one which was the important feature in the celebrated Garden City Purifier, and Smith thought that if he and his pals could only get hold of the patent for that device, they would be on the sure road to fortune. Immediate steps were taken to renew the application and soon began one of the most important interference cases on record, that of "Application of Milford Harmon vs. Patent of Louis Gathmann." A complete history of all the tricks which were attempted by the Smith crowd would fill a whole issue of this paper, and we will have to forego the pleasure of reciting it here. In-

vestigation soon showed that Gathmann had invented and used the device a whole year before the alleged invention by Harmon. This would have been a stumbling-block in the path of ordinary people, but George T. Smith and his pals have no use for an attorney who would stop at such little things. The war went on just the same. Every expedient which talent could suggest or money could pay for, was tried in the valiant attempt to wrest the Gathmann patent (now worth over \$100,000) from its rightful owners. Even before the final marriage of the Smith ring, with the still more notorious Cochrane ring, the little legal talent which the latter possessed was brought in to aid the conspirators in their efforts to obtain the right to manufacture the Purifier which they knew to be far better than any other in the world. On the subject of purifiers, George T. Smith is nobody's fool, and even his pals are wise enough to know a good purifier from a poor one. They all knew what they were striving for and fully appreciated the immense advantage it would be to them to be able to make and sell the Garden City Purifier instead of their own. The fact of their knowledge of the impossibility of getting anything more out of the millers by bull-doing was probably one of the reasons for the desperate tenacity of their fight. Beaten on all sides, they will now have to retire wiser, poorer, and we hope, better men. We would not do our duty to ourselves, nor to the readers of this paper, if we failed to call their attention to some of the advantages which the device which has been in dispute gives the Garden City Purifier over all of its competitors. Divested of the verbiage of the Patent Office, the claim was for a double carry-board, the simple device which enables us to build a machine occupying much less space, requiring much less power and at the same time having greater capacity than was possible without it. This peculiar construction also enables us to grade the middlings on the machine, and to have perfect control of the draught of air upon each grade. The importance of being able to grade both the middlings and the air is fully understood and appreciated by those who have made a study of Purifiers, and this accounts for the fact that a large number of the most successful millers in the country use and recommend the Garden City, as it is no doubt true that a majority of those who are able to distinguish between a good purifier and a poor one are also able to distinguish between good and poor methods of milling. We would ask you, reader, if you are not already familiar with the principles and construction of the Garden City Purifier, to send at once for a circular and study it carefully. After having done so, you will without doubt make up your mind (as did the ring) that the "Little One" is a good machine to have.

COLLINS &amp; GATHMANN.

#### THE ST. LOUIS FAIR—MACHINERY DEPARTMENT.

Messrs. Caldwell & Watson, the well known and extensive elevator builders, exhibit in the Machinery Department Caldwell's Improved Conveyor, now conceded by all practical mill and elevator men to be superior in many respects to any other conveyor now in use. Among the many points of excellence possessed by this conveyor is that it is all wrought iron or steel, with continuous and self supporting flights. The shaft is hollow and very small, rendering it light and cheap, yet true, strong and durable. It is made for any capacity desired, from 1000 to 10,000 bushels per hour, and is adapted to carrying all kinds of grain, flour, middlings, salt, sugar, cement, or any kind of crushed ore or minerals, and from its lightness requires but little power to propel it for mill and flour purposes. It is galvanized and entirely supersedes the old-time wooden shaft conveyor wherever introduced. The same firm have on exhibition a new and very superior elevator boot, being the first of the kind ever made and exhibited. It is all iron instead of wood, and, being adjustable, the bottom of the boot remains equidistant from the bottom of the pulley, rendering it absolutely self-cleaning and anti-choking, and being all iron, is of course fire-proof. It is the invention of Messrs. Caldwell & Watson, and was suggested to them by the many defects of the old old wood boot, and constructed so as to completely overcome all the disadvantages encountered in the use of the old style boot. Its principle and workings are the result of actual practical experience, and when once introduced will doubtless take the place of all other elevator boots. Messrs. Caldwell & Watson, whose address is 2709 Mill street, St. Louis, are among the most extensive elevator builders in the West, their operations extending all over the wheat and corn growing region of the Union. They have recently erected an extensive elevator at Pittsburgh, Pa., to replace the one destroyed by the mob during the strike. They are now constructing a large establishment for Gov. Pillsbury, of Hermann, Minn., and have built at least a dozen extensive elevators in and around St. Louis. The above machinery carried off the blue ribbon.—*St. Louis Commercial Gazette.*

#### \$46,000,000 IN SPECIE.

The public seem to need to be reminded of the fact that an important amount of calls for Five Twenties will mature within the next few weeks. From the 11th of October to the 16th of November, eight instalments, of \$5,000,000 each, of the bonds of 1865, become due and payable at the Treasury. This will bring out of the Treasury a supply of \$40,000,000 of coin, we presume all gold. In addition to this, the quarterly interest on the Fives of 1881 becomes payable on the first of November, amounting to \$6,335,000. Thus within the next forty days the Treasury becomes subject to the disbursement of over \$46,000,000 of coin; and, as nearly all the bonds to be redeemed are held at home, it is reasonable to conclude that very little of this amount will be permitted to remain in the Treasury from the neglect of holders to call for their money so soon as it is obtainable.

The transfer of this very large amount of gold from the Treasury, where it rests idle, to the banks or into general circulation, is calculated to have effects which do not appear to have been anticipated. Its bearing upon the gold premium are very obvious. An addition of forty-six millions to the stock of coin upon the market is calculated to extinguish the small premium on gold that still exists; and with the disappearance of the premium, gold would naturally come into general circulation in advance of the resumption of specie payments, which would materially facilitate the transition to take place on the first of January.

The effect of these disbursements upon the money market also must be important. They will make an addition to the reserves of the banks which would be equivalent to increasing the lending power of those institutions by over \$150,000,000, thus constituting an element of extreme ease in the loan market and stimulating the growing anxiety in banking circles to find a larger employment for idle balances. So far as ease in the money market may be supposed to contribute, in these times, towards the encouragement of business and a demand for investments, this sudden large addition to the available lawful money of the country must be regarded as calculated to have a very potent influence.

The present condition of the foreign exchanges suggests a strong probability that to this supply of coin coming out of the Treasury we may have important additions arriving from Europe. We showed on the 4th inst., from official returns, that the exports of August exceeded the imports by \$22,000,000, and that the foreign trade of the first eight months of the year left a balance of \$189,000,000 in favor of the United States. All the present conditions of our foreign trade indicate a continuation of this immense excess of exports. The freight engagements on breadstuffs and cotton for the next two months foreshadow an unusually large export trade, even for these times of unprecedented shipments; while we see no symptoms as yet of any increase in the imports. So long as bonds were being sent back from Europe in large amounts, there was a way of adjusting this trade balance without drawing upon the European stocks of specie; but now the reflux of securities has almost ceased and really few remain to be returned. It therefore seems within the range of reasonable probability that the condition of our foreign trade will call for the remittance of gold from Europe at an early day, and that, possibly, in important amounts.

These facts have a bearing upon the gold market, upon the public credit, upon securities and upon trade at large, which on the whole must be regarded as highly satisfactory and as tending to help the influences that are now promoting a sound revival of business.—*N. Y. Daily Bulletin, Oct. 9th.*

#### A READY MEANS OF ESTIMATING THE VALUABLE CONSTITUENTS OF CEREALS, ETC.

By means of a very ingenious method, first discovered by Mr. A. A. Hayes, of Roxbury, and Dr. Chas. T. Jackson, of Boston, it will be found that if a kernel of corn be split longitudinally, and immersed in an aqueous solution of sulphate of copper, the germ, or "chit," only, becomes colored green, thereby beautifully defining the limits of the phosphates by the formation of phosphate of copper. The same process may be applied to all seeds (except those of an oily nature), tubes, roots, and stems of vegetables for defining the parts containing phosphoric acid. If a kernel of corn be split open, as before described, and thrown into a solution of sulph-hydrate of ammonia, the "chit" will soon be changed to a dark olive color, which is due to a change of the salts of iron in the seed to a sulphuret of that metal; a dark-colored matter forming with the ammonia turns the vegetable coloring matter yellow, and the two colors combined produce an olive. Again, by taking split specimens of corn, or other grains, and soaking them in a tincture of iodine, the limits of the starch and dextrine will be distinctly defined—the iodine striking an intense blue with the starch, and a deep port wine red with the dextrine; so that, from this test, a rich violet (being the combination of the blue and red colors) will indicate the presence of both the starch and the dextrine in the grain. If the oil be extracted from the transparent horny part of the corn by means of alcohol or ether, the tincture of iodine will show the presence of starch in that part of the grain associated with the gluten. By these means we may easily cause any of our cereal grains to represent to us the extent and precise limits of its phosphates, iron, dextrine, starch and oil; and thus, by

the eye alone, we may form an approximate estimate of the relative proportions of these ingredients. Among other curious results of some experiments made by Dr. Jackson is the proof that the relative proportions of the phosphates in grain depend on the appropriating power of each species or variety; for an ear of corn having been selected which had on it two different kinds, namely, the Tuscarora and a variety of sweet corn, and these seeds having been split and immersed in the same copper solution, soon gave evidence that there was more than double the amount of phosphate in the sweet than there was in the Tuscarora. Now, since the kernels came from the same ear, and grew side by side, they obtained unequal amounts of phosphates from the same sap, derived from the same soil. A crop of sweet corn will take twice as much of the phosphates as the other variety, and consequently will sooner exhaust the soil of them. Some interesting facts were observed, too, in the variable proportions of phosphates in different varieties of the same species of other grains. The fact that the smaller grains, such as wheat, oats and barley, contain so much less than Indian corn would seem to explain their peculiar properties as food for animals, the more highly phosphatic grain being more likely to surcharge the system in adult animals with the elements of bony matter, producing concretions of phosphate of lime, like those resulting from gout.—*Scientific American.*

#### CONCERNING BREAD.

The art of the miller consists not less in properly mixing the various kinds of wheat to produce the best flour than in well grinding and preparing it for food. Wheat is of two principal kinds, known as white and red wheat, but there are numerous varieties of the plant which do not affect the color of the grain. The red is the stronger food and the grain is usually smaller and harder, while the white is the large grain, and particularly adapted to the production of fine white flour and to mix with red wheat for the same purpose. The red variety is most widely grown and in nutriment is to be preferred.

A hot summer and a sunny climate produce grain with the least proportion of water and nitrogen. Hence wheat from Southern Europe, the shores of the Black Sea, and the steppes of Asia and the Caucasus, is preferred in England, as is also that of any temperate climate in which the heat of the sun is great during the summer months, as for instance in the interior of America and Russia. Wheat does not flourish under a tropical sun or in a high northern latitude. By the miller's art wheat flour is adulterated with potato starch, rice flour, plaster of paris, pea flour, alum, sulphate of copper and other materials, which cost less than flour, or add to its weight or bulk at a cheaper rate.

According to the quality of flour will be the weight of water which it will take up and retain in the process of bread making. Flour produced from wheat of the finest quality, and in hot summers or in hot countries, takes up much water and is known as strong flour, but sprouted wheat or the produce of cold climates and cold summers yields flour of the contrary tendency. In practice 100 pounds of flour will make 133 to 137 pounds of bread, or an average of 136 pounds. The art of the baker is to increase this quantity, which he does by hardening the gluten through the agency of a little alum, or by means of a gummy mixture of boiled rice and water. Bread naturally contains a large quantity of water, or from thirty-six to forty per cent, but it is frequently made to contain greater amounts by the use of rice flour or potato starch, either of which will absorb more water than wheat flour. Another way to increase the quantity of water in bread is, after having incorporated as much water in the dough as possible, to put it in a hot oven, which causes the crust to form speedily, and thus the escape of water is prevented. This same object is in a measure attained by throwing sacks over the loaves when removed from the oven, thus preventing part of the evaporation, although the crust thereby suffers in crispness. Salt has much the same effect as alum, in making the bread white and firm, and in enabling the flour to produce a greater weight of bread from a given amount of the raw material. Various adulterations are practiced both in the flour and in the subsequent process of bread making, but the independent farmer who raises his own wheat and takes it to the neighboring mill need have no fears of being thus poisoned with alum or sulphate of copper.—*Boston Cultivator.*

**PATENTEES REWARDED.**—The following compiled from the *Tribune* indicates the manner in which Great Britain rewards her inventors: Since 1860 England has paid £102,775 to inventors for discoveries in connection with ordnance and small arms. Mr. Henry got £5600 for breech-loading rifles and improvements in firearms; Mr. Westley Richards, £2,375 for his breech loading carbine; Mr. Snider, Mr. Wilson and Col. Roden, £16,000 for their plan for converting muzzle-loaders into breech-loaders; Col. Snider got another sum of £5000 for the Snider rifle, and Mr. Lancaster £4000 for his plan of rifling guns and small arms. In artillery, Maj. Palliser got £15,000 for his chilled projectile, £7500 for his plan for converting cast iron guns, and £1500 for his improvements in artillery; Capt. Mowbray got £10,000 for his method of mounting guns, with £1000 a year and £5000 when his engagement ended in 1875; Mr. Hale got £8000 for rockets; Mr. Fraser, £8000 for construction of guns; Capt. Scott, £2000 for improvements in gun carriages and £8000 for other gunnery inventions, and Com. Harvey, £12,000 for torpedoes.



## DRESSING, BOLTING, OR SEPARATING.

BY JAMES M'LEAN, OF GLASGOW, SCOTLAND,  
AUTHOR OF THE MILLERS' TEXT BOOK.

After leaving the stones, the flour or rough meal is either run into bags and allowed to stand some days, when it dresses better, or it is cooled on traveling discs, with fixed angled blades directing it outwards and inwards, or in screws, and dressed at once. Generally the former method is used with wire machines, and the latter with silk ones.

In old times, with their mild-grinding heat, rapid cooling didn't seem to be approved of, mixed wheats ground and standing thus for some time, loosely packed in bags, being said to be improved thereby—no doubt by better fermentation. Americans, however, who often ground with an injurious heat, had to follow a different method, by cooling it as quick as possible; and as this course saves time, labor and expense, since the introduction of silk machines it has been followed in Britain also, although with mixed wheats it is an open question if it is the most profitable in the end.

Nearly all flour-dressing machines work as sifters—that is, separation by specific gravity, and sizing, although few imagine so. The wire-dresser is commonly imagined to work by sizing alone. Such is not the case, however. Separation by sizing is simple, and the principle always apparent. It is far otherwise with separation by specific gravity, as exemplified in the gold-diggers' operations, the oatmeal sifter and fanners, its application is extremely varied, and in flour separation especially the principle is apt to be lost sight of altogether, as the working of some patented machines testifies. If the miller reflects well on this principle, he will perceive that some so-called improved separators are in reality very poor ones; and by pondering on its working in its most original and simplest state, effects which too often seem a profound mystery are easily understood.

As mentioned before, nature shows the working of this principle, with its usual incomprehensible vastness, wind and water being the chief apparent agents. Water, which can either be a very gentle or a very powerful disintegrator, is equally efficient as a sifter, and the gold digger, with his sluice-box, uses it for both purposes at the same time, wind or air is like water in its effects, but has so much less density that its own natural motive power is rarely available or steady enough for sifting. Reflecting on these operations of nature, the digger's tin basin, oatmeal sifter, and the dust screen, it is apparent that the degree of motion has a vast influence. Without motion there is no sifting. Too violent, again, like the dust screen, it is very imperfect. The more violent a sifter's motion, beyond certain speeds, the less effective it is. Sifting, then, is simply motion at certain speeds, the heavier particles sinking, and the smaller ones dropping through the sieve holes, the large ones always keeping the light particles clear of the sieve or sheet. The importance of a certain speed is apparent when the same machines can be made good sizers, with a different rate of speed. The difference, then, between shaking sizers, fanners and sifters, is in the first. The motion is either so violent that the stuff is all jumbled through, or, if the motion is milder, it is so thin that no separation by specific gravity can take place, and all particles of a certain size escape; so that for sifting thickness of stuff is of great importance.

With fans the yielding motive power is applied to the particles with such force that their shape or form and momentum has too great influence, as instanced in the oats descending the vertical air current, like a spear; and much of the gold dust in the bottom of the digger's tin basin would be blown away long before the heavy stones could be affected. The dust, also, of the oatmeal sifter would have the same liability, before the heavy seeds could be moved, and the same with the flour and bran; fans therefore can never approach sifting for perfectness, except the substances to be separated differ widely from each other in their specific gravities. If otherwise, the particles of each substance must have regular definite shapes and sizes, presenting near the same amount of resistance to the current in proportion to their size and weight. This should always be kept in mind, as of late in some machines sifting is rendered too much subordinate to wind. The oatmeal revolving sifter and digger's tin basin are instances of the extent by which the principle, applied in this form, can separate, and it does so to an extent that is almost incomprehensible. The easy centrifugal swing, with the rough-edged holes in the one, and the water in the other, keeps a gentle motion in the dust that does

not adhere to the lighter particles descends with the heavy round stuff, as if by magic. Well may the young miller, when using a hand-sieve, which works exactly similar, wonder how the dust descends. Fans would blow away all the dust soonest and farthest. It is slow in action compared to fanners; but, like breaking a bunch of sticks one by one, it can do what the other cannot. It is the innumerable particles lying on and communicating an infinite gentle, unyielding pressure and motive power to each other which allows the slightest difference in specific gravity to prevail, the incessant motion giving them every opportunity to edge downwards, without momentum, and let the particles arrange themselves accordingly. It will thus be observed sifting requires an amount of stuff on the surface sufficient to keep the lighter particles from touching it, and that the more mild and gentle the motive power, so as there is sufficient motion, the more efficient the sifting, till the particles are so far separate in relative weight as to counter-balance the effects of shape, when the speedier agency of wind is applied; and from the greater toughness of the bran, the difference in weight of the particles increases faster than their diameters.

The flour separators are the silk and wire machines, and the various shakers and air currents. As for the old cloth-covered bolters with beaters, they have been so long extinct in some parts of the country, the oldest millers often never having seen them, that I need not, or cannot, say anything about them, never having had personal experience of their working. The principle of their action, however, is sufficiently illustrated by the others.

The silk dresser is generally admitted to be the most efficient, surpassing all others for efficient flour sifting, though not for speed, as observed before, all other circumstances being equal; good sifting requires time, which the working of this machine can show to a remarkable extent, and like the digger's basin, revolving sifter and hand-sieve, it is extremely simple, and the less its simplicity is interfered with the better it performs its work, and many so-called improvements in reality tend the other way. It is in the form of a hexagon or six-cornered frame, commonly over three feet in diameter, of different lengths, according to circumstances, with an incline, if the stuff traveling inside is not interfered with, of from an eighth to a half inch per foot of length; some being arranged so as they can be raised or lowered at one end as desired. The cloth generally travels at a speed of from three to four feet per second; and often there are wooden balls on iron rods on the inside, which, as the machine revolves, slide down, and give a smart tap on the frames. The cloth sheets, which are commonly betwixt thirty and forty inches wide, and can be obtained as high as two hundred threads per inch for French, or one hundred and eighty for Swiss cloth—the Swiss threads being generally thicker—is arranged with considerable difference betwixt head and foot, such as ninety at the top end, and one hundred and fifty at lower end, of fine sheets, which is used by many. The sharps cloth is then arranged with less variation of numbers, the highest generally being a little under the lowest of the flour numbers. The thirds or pollard cloth is then fixed, with no variation in their numbers, the bran going over the end.

This machine, which I will call the hexagon, to avoid confusion, as silk is used in other machines also, although still wrought in some districts after the above-mentioned arrangement, doing all the dressing required at once, without any more regrindings or siftings. In others, the arrangements are so various, that to mention the different machine sizes and various cloth numbers used of, only a part of them would only be giving a confused list of no benefit whatever; and I shall confine myself to the principles of the different systems followed, nearly all agreeing in having the cloth traveling rate between three and four feet per second, and the diameter over three feet.

As to the silk, its extraordinary durability and fine sifting surface is too well known to require anything said about it. Oat seeds sometimes cut it badly as they get old and thin on the parts when there is not sufficient pressure of stuff to work them out. Some put them in or draw them out with a soft haired brush, others use any sticky material which leaves the silk clean, but adheres sufficient to draw them out. In some countries, if the machine stands long insects out it badly unless well looked after.

The hexagon shape would seem to have been adopted as the best for sifting, the cylinder being a slow sifter, with too much rolling for perfect work, the motion with the square

would be too irregular, and more apt to be checked with violence at the end of the slide. As for the average diameter, betwixt three and three and a half feet, it is curious how closely the speed and amount of traveling at each slide corresponds with that made by the revolving sifter at each revolution, hand sifters inclining to the same amount of speed. The inventor, who appears to have been a Frenchman, would seem to have understood sifting better than many others who have tried to improve it. As to the reasons of its being level or with an incline, its length, the variations of the cloth numbers, and the object in having balls, they can be best accounted for by comparing it with other sifters.

As noticed before, the revolving sifters surpass all others for thorough sifting, but they appear never to have been used for flour except in the laborious hand-sifting process, nor have the direct shaking sifters with several sieves. Flour sifters as yet having only one sieve. The hexagon inventor would know the principle well, as it appears to have been principally hand sifting before that, and he would know the difficulty to be encountered by applying silk to a flat surface, it being a yielding flexible material, the stuff would be too irregular in depth when in quantity sufficient for proper sifting, and supporting it to be level would but increase the liability to choke with a gentle motion. The idea then would occur of having a cylinder with vibration to make the particles drop back again from the top, similar to the hand-sieve man reversing his sieve and striking some object violently with the rim to make the particles drop out, as he knows from experience they come out easier that way than forcing them through the way they entered. Practical experience then would make him prefer the hexagon shape, and determine the necessary incline. As the flour is continually on the ascending side its weight does not bend the cloth so much as on a dead level, and any bending affects the sifting but slightly. With those advantages over the level sifter its motive sifting power may rank equal to the direct shaker with one sieve, but inferior to the revolver. As ascending a certain distance the stuff is motionless, when it begins to descend the motion is gradually accelerated till the maximum is attained at the bottom, where it is gently checked and stopped. It is thus similar in its irregular motion to the shaker. The crank on the outside shaft giving little motion when nearest and farthest from the sifter, and gradually increasing each way till the shaft center is reached. The hexagon is less affected by inequality of speed. The others, if too slow, stopping sifting altogether, and requiring very regular motion for good sifting, while the hexagon can sift as long as there is motion. Centrifugal force disturbs proper sifting, with it as with the revolver, if driven too quick; but the effects are less than the violent jerks of the shaker when too fast.

As proper sifting is the incessant motion and change of position, allowing the particles to arrange themselves according to their specific gravities, it follows that tendency to arrange themselves should never be disturbed. Here the frames of many machines act most injuriously; in fact, the hexagon is far too often looked on as a sizer, instead of a simple and most efficient sifter. Many of them have huge frames; which, when the stuff slides down the incline intercepts the heavy rolling stuff at bottom, letting the lighter stuff at top shoot over next the cloth, the frame taking a large quantity with it, and then letting it tumble all through. It is an easy affair to have a frame strong enough so as the stuff will roll or slide over with little obstruction, disturbing the arrangement of the particles as little as possible. The entering flour needs also to be directed on the top of the moving mass as much as possible. As the stuff in the inside of the hexagon resembles that on the top sieve of a sifter, how is it that sifting in the former is so much interfered with, while generations of practice has taught them to leave the almost mysterious arranging of particles in the latter alone. The gold-digger is so amazed at what it can accomplish that he often regards it as one of the mysteries of nature. The only reason I can imagine is, the tendency to regard it solely as a sizer. Looking at the top sieve of a sifter it will be seen that it needs no air currents, no blades, to direct the stuff outwards; nothing but the slight incline on the top of the stuff. Wind will only add injurious pressure; blades disturb the arranging of the particles; and I have always found that the simple hexagon, with the sliding balls inside to keep it clear, and the incline arranged so as to be varied at will, was by far the most efficient sifter. The chief difference noticed in good or bad dressing with the hexagon is

that when well done with equable ground stuff, there is a very small proportion of solid sharps, a considerable portion of them being composed of light brown dust. This is pulverized bran which no other process but careful sifting can separate from the fine flour, as it is as small in size as it—the remarkable effects of bran in deteriorating the color of the bread, much beyond its effects on the flour, attributed of late years to cereoline, is too well known to say anything about. Where there is bad sifting again, as is sometimes noticed, with the so-called improvements, the proportion of solid sharps is so great that the brown dust can be noticed no longer; and too often it is amongst the flour, or if amongst the sharps, the proportion of solid flour amongst them is so great as to disguise it; and from the pernicious effect of regarding the hexagon solely as a sizer, the miller too often thinks it is doing its duty well in taking out so large a quantity of sharps, which in too many instances is but deteriorating the flour.

As to the variation in cloth numbers, experience shows the great difference in numbers required, generally fifty or sixty threads an inch of difference for the fine flour between the extremes; this is well illustrated by the oatmeal sifters also, but in a superior way of working which is adopted by some mills for flour also, it would be noticed that in those each sieve has the holes all of one size, but the holes of each gets smaller as the stuff descends. Also the different modes of working them, such as grinding, the returns of one sieve only which is the best for good produce, others again grinding the returns of all the sieves which is the best for a neat cut. It would be observed also the one sieve return grinder arranges the depth on the top sieve, so as it is all a smooth motion, except a few inches at tail end, where he allows it to be so thin that it rolls in confusion on the rough edged holes, for the purpose of taking out as much dust as possible, this rolling motion has a great influence in hexagon dressing, and partly causes the variation in cloth numbers; so great is its influence combined with the decreased depth of stuff, that it will be observed in spite of the great difference in numbers, the most specks come through the finest sheets, the cause of this is the same rolling motion observed at the end of the sifter, the stuff as it travels along the hexagon gets less in bulk, and also sharper or rounder, from the loss of the smaller particles escaping, the variation in bulk, thus affects the depth when it would require to be getting deeper; for effective sifting, and the increased sharpness gives a rougher traveling motion, tending to roll the thin mass all through. After leaving the fine sheets, the bulk alters but little, and less variation in number is required for the sharps. For their efficient sifting a different system is required.

The increased fineness of the sheets, then, as the perfect sifting decreases, takes as much dust as possible out of it, as so much adheres to the larger particles that it needs more violent motion to disengage it; and as bran is tougher than the flour, the proportion of pulverized bran decreases as the size decreases; and as the sizing principle is more developed on the fine sheets, there is less liability to let bran through. As when the motion is too smooth, the sifting is very slow, this rolling motion is taken advantage of in many mills by returning a portion of the finest sharps to make it dress quicker, commonly having a shifting board with movable sides kept out by springs, so as they can return less or more, or none at all, as they wish; thus, when on soft tough stuff they will return a considerable portion, which has a great influence on the dressing speed, when on free dry stuff they will often return none at all. This difference in the dressing speed is caused solely by the sharps causing a rougher traveling motion. Some millers are difficult to convince on this subject, and certainly it looks a little odd to help the dresser by giving it more work; but when once they see its great effect, they seldom fail to take advantage of such a handy regulator.

This system of having all the numbers in one continuous line is much inferior for efficient sifting to that of the other sifters, having the different sizes under each other; but it is impossible to have the hexagon arranged similar. A glance at the products of the fine sheets shows how inefficient the highest numbers are in keeping out specks when the rough motion disturbs proper sifting, and still the depth necessary for proper sifting causes a heavy loss from the flour dust carried over with a smooth motion. The oatmeal miller who returns the product of the upper sieve alone for fanning and regrinding, gets over this difficulty in a most efficient and simple manner. The sizes of the sieve holes are ar-



ranged so that the bottom sieve has always sufficient quantity all over it for a smooth motion and as this is always returned direct to the sifter again, there is no loss. This mode can also be applied to the hexagon, as it is to a partial extent in some mills, by taking out the thirds and bran first, and having another hexagon for separating the sharps and flour; although the separation of the thirds and bran is purely a sifting affair, this mode may be said to resemble a sifter with two sieves; others again give it a third run through, thus resembling a three-sieve sifter; they may thus run it through as often as they choose, the advantage then of running it through several times is that each hexagon can have only one number of cloth, and, the rolling motion so little developed that the sifting will be far more perfect, and the extreme fine numbers of cloth avoided altogether, as there is less dependence on sifting. Such as when freed of the thirds and bran, it is run through a hexagon, covered with cloth of ninety; a rolling motion can be kept up at the end to free the large particles of the dust; the flour then enters another hexagon covered with cloth of a hundred, and it is dealt similar with, then 110 cloth; but instead of having any rolling motion with this, the last one, a smooth motion is preserved throughout, which will send over a little of the fine to keep the sifting perfect; and the sharps from which, will need different treatment, as the two former can be exposed to air currents at once, as the dust is taken out of them; whereas, the last will require to be sent up into the first hexagon again, similar to the oatmeal miller's practice; or sifted by itself to take the flour out before exposed to air currents, as separating by air is much inferior that the flour particles have to be a considerable size before they can be trusted to it. Although even this method is scarcely equal to the other sifters; as with them the thinnest and worst separated portions are always dropped at the tail end, and soon run over; this is impossible with the hexagons, but if the entering flour is dropped on the top of the moving mass as much as possible, it is the nearest approach to it that can be made. This system, besides the great saving it effects in doing away with the finest and most expensive of the silk sheets, is also much more effective for thorough sifting, or eliminating of bran dust, which acts injuriously both on the color and strength of the flour.

As to the cloth number and mode of proceeding mentioned, it is merely to illustrate the system. Oatmeal millers differ in their modes of applying it, influenced by surrounding circumstances; and the flour miller will need to vary still more; and the millers in each district will be the best judges as to the cloth numbers required, the difference between each, and the amount returned for the redressing; but the advantages of the system are great in whatever mode the details are carried out. The amount of bran dust that comes through the finest sheets shows that sifting should never be trusted to for efficient separation. If two or three numbers are used, an odd sheet each way makes a great difference, such as after having the proportion settled, and ninety proved too fine to commence with, eighty is substituted, and the highest number taken off; or if ninety is too coarse, it is put aside and a higher number put at the other extreme. Small mills especially should never be without the means of returning more or less sharps as they wish to help the dressing, and these as free of bran dust as possible, as it is a most convenient regulator. Such then is the hexagon in its simplest and most efficient forms. All the aid it requires is the smart vibration caused by the shock of the descending balls to keep it clear. What would an old miller, working with the other sifters, say if wind was applied to blow the stuff downwards? The answer would be, where the stuff is thin enough for the wind to have effect, there can be no sifting, and that the seeds would be still more readily blown down. Again, if wind was directed upwards, the answer would be as before, there could be no sifting where the wind had effect; and that wind is so inferior to sifting that, where there was dust, it would be blown up as well as the seeds (and flour dust is not always inferior flour, as is often imagined; some hard wheats can be made all dust apparently, and yet be strong, good working flour, with a very small proportion of felled stuff). As for conveyors again being employed, so as to supply the place of the incline, would say it was mischievous labor, breaking the uniformity of the depth, and interfering with the almost mysterious arranging of the particles.

As the separation of the bran and thirds is a mere sifting affair, they are better got quit of at first with a wire machine, whether inclined or vertical does not signify much, the brushes

cleaning the flour dust thoroughly off; but I shall mention more fully about them afterwards.

More in connection with the hexagon are the different sifting and wind appliances for cleaning the sharps; and what with the other sifters is a very simple affair, is with the flour ones often made a very complicated one, real sifting being often lost sight of altogether. It may surprise some, seeing that the returns of the other sifters were always fanned before being ground, how it never occurred to former flour millers to apply the same treatment to the sharps; but as mentioned formerly, there was always a good demand for them as they were at a high price; and with those who ground higher than ordinary making better flour, the increased loss with the bran alone made it unremunerative. Circumstances are greatly altered now. Bread from sharps has almost disappeared, while the consumption of fine and fancy breads has increased; and as long as injurious compression has to be avoided, and the bran to be cleaned, there must always be a considerable portion of pulverized bran, which sifting can never separate without heavy loss, and requires the most effectual modes of sifting, as that mode is proved to be gentle motion of the stuff in depth sufficient to allow the particles to arrange themselves according to their specific gravities, and keep the light particles clear of contact with the sieve, the weight above at the same time helping to force through the particles next it, the hexagon and flat sieve being only different modes of applying the principle. Still, circumstances connected with proper sifting requires another mode to be brought into action.

It will be observed that in sifting, a portion of the heavy stuff is always too large to go through the sieve; in short, it is impossible to get a clear finish betwixt the light and heavy stuff without destroying sifting, except by allowing the lighter stuffs to run over an elevation or ridge, to preserve sufficient depth, to keep the sieve clear of the light particles; but at this stage, the small particles of flour, which are the most difficult to separate, are got quit of, and the other mode, wind, which sometimes needs no arranging of particles, and is therefore more speedy, begins to be effective, and the rounder or larger the particles get, making sifting more difficult, from the increased violent motion in the hexagon, the more effective the wind. What then is the most efficient way of applying the two modes? The miller is bewildered by the numerous machines, each of which of course can beat all others; and, curious enough with some of them, sifting is lost sight of altogether, nothing being equal to suspension in air, which, if a miller, who knows what sifting is, reflects a little, will see is sheer nonsense, as sifting is continually demonstrating before his eyes that it can accomplish separation where wind totally fails; and if the sharps are very small, or any flour amongst them, wind should never be trusted to for effectual separation, however gentle.

They are generally hexagon or shakers, and the wind is used both before entering the fans and after leaving them. As to the hexagons, not much more can be said about them, except that, as the stuff is all sharper, it requires a greater depth if farther sifting is required to prevent the rolling thorough motion reaching the top and involving the lighter particles, which greater depth cannot be obtained with wind going through them either way, in which case it is size and wind alone which has any effect, and the hexagon gives it a large surface to act on with long continued action, although in rather an unhandy complicated manner.

As for the shakers, they are commonly narrow and light enough for being end ones, having only the one sieve, and are generally supported on short wooden springs, and driven with different sized cranks, and at various traveling rates, some having brushes below to keep them clear. Occasionally they are used solely as sizers, wind being applied in a variety of ways. The importance of smooth or violent motion should always be kept in mind, according as sifting or sifting is wanted. Surface wind traveling is the only method of getting both sifting and wind to act together before the stuff quits the shaker, and then only advantageously with the wind at the tail end, where the light particles are evolved on top.

As the shaker is equal in sifting power to the hexagon, it is not equally clear of disadvantages attending its working with cloth for perfect sifting. The cloth is apt to bend with a heavy covering of stuff, unless well supported, which again makes it readily choked up. If the stuff is kept thinner, it chokes more readily still, as a heavy body of stuff traveling has a great tendency to keep the holes clear,

as may be observed both on hexagons and sifters, where the stuff is deepest. More rapid or violent motion tends to keep them clear also, but at the same time makes the sifting more imperfect, so that, on the whole, as a cloth sifter it is much inferior to the hexagon. As a sizer, again, it is much superior to it, and more advantageously arranged for wind action. The thinness of stuff necessary for thorough currents of air is all the better for sifting, while violent motion can be applied to keep it clear almost without further aid.

As for wind appliances, tail-boards are of little or no account, the stuff being commonly either too small or dusty for them keeping clear, however steep. The air currents need to be as evenly and regularly diffused as possible, on such light particles; and as the fan-ners are generally at some distance, this is easily attained, the distance helping regularity and equal diffusion. As to catching the stuff with horizontal or vertical air currents, far too much importance is ascribed to the latter for superior effect, often described as weighing the particles and carrying them off, or letting them fall, according to their specific gravities. This sounds very well on a superficial view; but watching the practical effects makes one come to a different conclusion. As mentioned before, other circumstances have such an influence on separation by wind that it can never equal sifting when there is great irregularity of shape; and as bran is the subject to be got rid of in this instance, it and the sharps can be imagined on a vertical current; the flour is more globular in shape, and the bran is longer and thinner, its breadth being according to the number of the wire or silk which separated the broad bran, if the one end happens to be heavier than the other it presents the least possible resistance to the current immediately, its less specific gravity being often more than counterbalanced by the smaller resistance to the air pressure, and a very slight difference in size would make it descend through a current which would elevate the more globular one; while, if let descend on a horizontal current, it is struck and carried some distance at once before momentum has any effect, and long particles can never assume so favorable a position, presenting so little resistance to the current. It may be said this is only an imaginary instance; but from what I have observed, with wind currents, when the effects were plainly seen, it corresponds to what actually takes place in noticing the results on a large scale. And what is it but the irregularity of shape—not being in proportion to the current resisting surface—which makes wind a total failure in the separation of flour and bran, and letting the stuff fall on a horizontal current reduces these influences to a minimum.

#### NEW AND STALE BREAD.

The nature of the difference between new and stale bread is far from being known. It is only lately that the celebrated French chemist, Boussingault, instituted an enquiry into it, from which it results that the difference is not the consequence of desiccation, but solely of the cooling of the bread. If we take fresh bread into the cellar or into any place where it cannot dry, the inner part of the loaf, it is true, is found to be crummy, but the crust has become soft and is no longer brittle. If stale bread is taken back into the oven again, it assumes all the qualities of fresh baked bread, although in the hot oven it must undoubtedly have lost part of its moisture. M. Boussingault has made a fresh loaf of bread the subject of minute investigation, and the results are anything but uninteresting.

He took a round loaf one foot in diameter and six inches thick, and plunged a thermometer into it three inches deep, immediately on being taken out of the oven. When the thermometer was taken out it was found to indicate 78 deg. Reaumur (207.50 Fahrenheit). This might well appear surprising, seeing that the oven was heated to 240 deg. R. But we must consider that the inside of the loaf, on account of the water with which the dough has been mixed, the temperature cannot rise above boiling heat, that is 80 deg. R. (212 deg. F.), as long as the bread has not lost all its water and become perfectly dry. But it takes a long time to come to that on account of the protective thick crust. The loaf was then taken into a room heated to 150 deg. R., the temperature of the air. At this time it weighed 7½ pounds. In twelve hours the temperature of the loaf sank to 19 deg., in 24 hours to 15 deg., and in 36 hours to 14 deg. In the first 48 hours it had only lost 2 ounces in weight, which in a loaf of such a size and weight must be considered an insignificant loss. When after 6 days the loaf was again put into the oven, and the thermometer indicated that its temperature had again risen to 55 deg. R., it was cut and found to be as fresh and to possess the same qualities as if it had been taken out of the oven for the first time; but it had lost now, not merely 2 ounces, but 12 ounces in weight. M. Boussingault now made separate experiments with slices of the loaf, and also with the crumb, all of which showed precisely the same results, so that it may be considered fully established

that stale is distinguished from new bread, less by containing a smaller quantity of water than by a peculiarly altered molecular condition, which begins to manifest itself in the process of cooling, which continues to develop itself more and more, and lasts as long as the temperature remains essentially unchanged, but is annulled the moment the temperature has reached a certain height. The molecular condition is the form and the union of the smallest parts dependent upon it; it decidedly indicates a mechanical relation which undergoes changes in consequence of chemical processes. It is this mechanical relation also which makes the difference dietetically between new and stale bread. New bread, in its smallest parts, is so soft, clammy, flexible and glutinous (in consequence of the starch during the process of fermenting and baking being changed into mucilaginous dextrine), that by mastication it is with great difficulty separated and reduced to small pieces, and in its smallest parts is less under the influence of the saliva and digestive juices. It consequently forms itself into hard balls by careless and hasty mastication and deglutition, becomes coated over by saliva and slime, and in this state enters the stomach. The gastric juice being unable to penetrate such hard masses, and being scarcely able even to act upon the surface of them, they frequently remain in the stomach unchanged, and, like foreign bodies, irritate and incommode it, inducing every species of suffering, oppression of the stomach, pain in the chest, disturbed circulation of the blood, congestions and pains in the head, irritation of the brain and inflammation, apopleptic attacks, cramp and delirium. —London Miller.

#### DOCTORING BARLEY.

Towards the end of September a man named E. P. Bigelow sent two car loads of barley to Milwaukee, from Lyle, Ia., one being consigned to Messrs. Wall & Bigelow, and the other to E. P. Bacon & Co. This barley, as it happened, fortunately, was sold by sample, was side-tracked and not inspected into the elevators, as a reckless contemporary asserts.

The man Bigelow then wrote two letters to Messrs. Wall & Bigelow, saying that he could supply several carloads of such barley from Onaga, Ia., and marking the letter at the bottom "strictly confidential." The fact that the point named does not contain that amount of first quality barley, together with the injunction of secrecy, aroused Mr. Wall's suspicions.

Oct. 4, a man entered Mr. Wall's office, gave the name of E. P. Bigelow, and drawing the head of the firm aside, proposed to send to this market 20,000 bushels of such barley as they had received from him. He produced a box containing a sample and whispered to Mr. Wall that it was doctored; he and certain parties had a method of bleaching it by sulphuric acid and then deodorizing it. Meanwhile, it should be mentioned, Mr. Nat H. Halderman, a gentleman who is connected with the establishment of Wall & Bigelow, who has an eagle eye for sampling grain (in its non-germinated state) had pronounced a sample that had been saved from that car-load "sulphured," but after submitting it to the heat test and failing to develop any odor, had abandoned his suspicion.

Mr. Wall met the scamp apparently half way, invited him to the theater, and told him to call again. When the man left the office, Mr. Wall went in search of the District Attorney. Before that official could be found the man had left town. A warrant and a requisition upon the Governor of Minnesota were obtained, and Deputy Sheriff Aldrich who was made State Agent, left at once for Iowa. Through some leaky vessel, in either the Sheriff's or the District Attorney's office, some intimation of what was on foot reached the ears of an inconsiderate reporter of an evening paper, and although the game had not been heard from, and the State Agent could not have reached his destination before 9 o'clock last night, to the immense disgust of Sheriff Sanger, Mr. Van Vechten, Mr. Wall, and all persons concerned on the side of justice and the law, there appeared in print last evening enough of an account to warn the culprit and flush the game. The *News* having acquired full information of this case, through its private detective agency, something over a week ago and long before it came into the hands of the authorities, caring more to subserve the cause of justice than to produce an immature sensation, had withheld comments, intending to accompany them with an announcement of the capture of the criminal. —Milwaukee News.

**THE STEAM WAGON**—We learn from the *Colusa Sun* that the steam wagon, belonging to the San Joaquin Company, made a round trip from Princeton to Willows. The writer was at Princeton last Tuesday when it came in with a load of wheat. It was loaded with twenty tons of wheat by J. S. Wall, but the rods connecting the wagons broke just before it got to Princeton, and they had to come in with only two wagons. It was a day and a half getting in from Willows, but there was no heater on the boiler, and there were several other deficiencies noticed, but Capt. Roberts, who was with the wagon all the while, is entirely satisfied that it is a success, and he says the company will immediately invest \$60,000 more in the manufacture of the wagons, and in wagons to carry the freight. They took the wheat from Willows to the ship side at San Francisco at \$3 a ton, the same as charged by the railroad to Vallejo. —Mining and Scientific Press.



## THE PROBLEM OF MILLING AT THE PRESENT DAY.

[Translated from Pappenheim's New Work on Milling, for the London Miller.]

From time immemorial it has been regarded as the problem of the miller to obtain the nourishing part of the grain, and so to prepare it as to make it the most easily digestible by the process of baking. In modern times, especially since Liebig, the great chemist, lifted the veil with which, up to that time, the chemical process of nourishment was almost totally hidden, this problem has been immensely widened by the demand upon the miller to render accessible to mankind all those nourishing matters of which it was believed corn was deprived by taking away the bran and using it as fodder for cattle.

Liebig, and the physiologists who adopted his idea, were actuated by the opinion that the layer of glutinous cells removed with the bran contained the most valuable nitrogenous substances, which, when mixed with the flour, afford the best material for human nourishment; but as millers declared that in the present condition of technical science they were unable to separate the bran from the layer of glutinous cells, Liebig and others thought that under these circumstances it was better to mix both the bran and the indigestible wood fibre in the bread, than to lose with the bran the most nourishing substance of the wheat, and thus deprive mankind of a source of nourishment of the annual value of millions of pounds. In consequence of this we began to make whole-meal bread, and even introduced it into sick chambers and hospitals. But science never stands still. The question raised by Liebig was further examined, and the nourishing properties of bran began to be disputed. Experiments, especially those of Poggiale, showed that bran is indigestible. He fed dogs with bran and meat soup, collected the remains of the bran voided with the excrement, washed it and gave it a second time to a dog, and lastly to fowls. The result was that the bran, after passing through the digestive organs of these three animals, still contained the third part of its nitrogenous contents. Experiments which were instituted some years since in the laboratory of Professor Voit, of Munich, showed further, that white bread furnished the least and brown bread the largest, quantity of excrement, a further proof of the indigestibility of the outer husk of corn. Moreover, Napoleon III. caused some experiments to be made in a Paris bakery, under the guidance of the celebrated chemist, Mege-Mouries, respecting the nourishing properties of bran. Mege-Mouries found that bran contains cerealin. As this in a high temperature exercises the effect of a ferment, and quickly brings on lactic acid and butyric acid, and decomposes the gluten, the bread made with bran is black and sour. True, this may be avoided by causing flour containing bran or cerealin to ferment with yeast and sugar before baking, which either decomposes the cerealin or destroys its efficacy. Mege-Mouries on this point, he founded a new system of baking, with flour containing bran, which is still in use in France. But the Vienna bread, especially the imperial (Kaisersemmel), cannot be made of flour containing cerealin, and Vienna bread, which is being more and more diffused throughout the civilized world, cannot be produced with flour mixed with bran even if the latter were ever so digestible. According to the present state of science, however, the indigestibility and the presence of cerealin are not the only reasons why bran is worthless as a source of nourishment. Professor Schenk has shown that bran contains no gluten. This fact has given the coup de grace to the theory which main aims that with the bran the most nourishing ingredient in wheat is lost; but if anybody should still imagine that any other digestible substance is contained in the gluten cells let him read the account of the experiment undertaken by Professor Rathay in 1874, and he will soon be convinced of the contrary.

With respect to this experiment Rathay writes: "During the last Easter holidays, and in fact throughout the whole of the previous week, I have lived almost entirely upon the bread sold by Adolf Hagg, baker, of Vienna, which, as is known, is made without salt, of the coarsest meal, and without fermentation, consequently without either yeast or sour leaven, drinking besides only a little Russian tea. On examining the excrement produced by it, and in fact that of the fifth and seventh days from the commencement of the experiments, I found the grains, which were not much the worse for mastication, softened it is true, but nearly wholly undigested, and so perfect in every part that with little trouble I could have ascertained their anatomy. The outer husk was not in the least digested, neither was the layer of gluten cells, which cells, in respect to their contents, did not differ in the least from those of a raw grain of wheat. Viewed in glycerine under the microscope, the lentil-shaped kernel and the gluten flour grains were as plainly visible as in a grain of raw wheat, whilst the state of their contents, as opposed to the characteristic reagents for protoplasm and glair, showed that they had passed through the intestines without undergoing any change. Besides the totally undigested wheat grains, the greater portion of the matter consisted of pieces of husk, some small and others larger. They were evidently the undigested remains of the meal from which this particular bread is made, which contains a small number of grains either wholly unground or nearly so. On examining these pieces of husk I was made

aware of the interesting fact that they consist of the skin of the wheat and the layer of gluten cells, and that the latter, like those of the imperfectly ground wheat grains, leave the intestines in an undigested state. Probably the thick and undigestible cellular skin protects the contents of the gluten cells against the influence of the digestive juices.

"The first-named circumstance, that the imperfectly ground wheat grains were wholly undigested, shows how necessary it is that they should be ground into flour. The last-mentioned circumstance, that the fragments of gluten cells passed through the system without undergoing any change, contradicts the general belief in the nourishing qualities of whole-meal bread.

"Whole-meal bread is said to be more nourishing than bread made of fine flour, because, besides the glair of the inner part of the endosperm it contains also the glair of the gluten cells of the bran.

"But do these gluten cells ever get digested whilst, as in bran, they are enclosed in a thick cellular skin? We can, it is true, point to the circumstance that farmers feed their cattle and their pigs to advantage with bran, but that is no proof of their value to man; we must not conclude from this that they contain any digestible matter for him, because it is well known that cellular matter is digested in large masses by ruminating animals, but only in small quantities by man. When Liebig in his chemical letters writes: 'The separation of the bran from the flour is a matter of luxury, and is injurious rather than useful for nourishing purposes,' I don't know if besides the nitrogenous contents of unbolled flour, he also takes into account the digestibility of their respective glairs. Moreover we may imagine that the small particles of bran contained in unbolled flour—and it is of these only that Liebig speaks—contain digestible glair, but it is certain that the small branny particles which are mixed with the flour are a matter of luxury, at least for all those who possess digestive organs like myself, that for the purpose of nourishment they are not useful but pernicious, and that consequently the so much praised whole-meal bread does not possess greater nourishing properties than white bread for me and others like me."

The value of bran for cattle feeding must therefore chiefly consist in the starch cells of the flour grains so rich in glair which still cling to the bran, as neither with stones, rollers, nor brushing machines can the smallest particle be detached from it, and of the germs mixed with it, and not, as is supposed, in any glair belonging to the bran. It is possible also that if a substance containing nitrogen is really contained in the gluten cells, it is capable of being digested in the stomach of an animal, whilst the human digestive organs are insufficient to open the liguine of the integument of the gluten cells. If it should ever come to pass that we are able to peel wheat or rye so as only to remove the outer integument, this would be no advantage, but the contrary. We may remark, however, by the way, that it is inconceivable that with the anatomical condition of the grain, in consequence of the fissure, that we shall ever arrive at such a method of hulling by mechanical means.

A most interesting experiment which Prof. Kick made showed how much per cent. of those parts are separated in the process of grinding. He steeped a number of wheat grains in water, carefully separated the husks, the gluten cells, and the germ, and on weighing the whole the following was the result. The beautiful white wheat consisted of:

Outer rind	}	(Bran).....	18 per cent.
Integument			
Gluten cells			
Germs			
Starch cells		(Flour substance.....	82 per cent.

This experiment proves that it is absolutely impossible to convert the whole of the nitrogenous ingredients of wheat into flour by hulling it.

As regards the germs they doubtless contain very valuable nourishing matter. But on account of the oil they contain, when mixed with flour they serve to discolor it, and in consequence of the ready liability to decomposition of the oil, the flour will not keep. As regards flour for commercial purposes, not only the bran but the germ must consequently be eliminated. For immediate baking and eating, that is, for purveying purposes, the germs, provided they are not rancid, might be left in. But the best use to which they can be applied is that of cattle feeding.

If, therefore, after these considerations we desire to arrive at the conclusion as to the real end and aim towards which milling should strive, the object may be summed up in the following words:

"The problem of milling is, to separate in as simple and cheap a manner as possible the interior of the grain from the outer rind, the beard, and the germ; to thoroughly grind the cells of which the grain is composed, and by setting free the glair substances and starch grains from the outer integument in which they are enclosed, to facilitate a quicker and more intimate contact of the nourishing qualities contained in the wheat with the human stomach."

The Austro-Hungarian high milling, with its nicely effected elimination of even the smallest modicum of bran, and its fine and careful grinding, of all other methods approximates the nearest to this ideal, and the bread made of flour so treated is consequently the most nourishing and the easiest of digestion of any bread in the world.

According to this theory, if we would answer the practical question, "How much pure flour can be got out of corn?" the above-named experiment will enable us to do it in the following figures:

Pure Flour.	Waste and Fodder.
Wheat 78 to 82 per cent.	18 to 22 per cent.
Rye 75 to 80 per cent.	20 to 25 per cent.

## HUNGARIAN WHEAT AND FLOUR.

[Translated from the Pester Lloyd for the St. Louis Evening Post.]

A friend has sent us a proof copy of the "Annals of Chemistry and Pharmacy," in which are detailed the results of a very important investigation respecting Hungarian wheat and wheat flour flour, prosecuted by Herr O. Dempwolf. We reproduce below those portions of the essay which are of interest to a large circle of our readers. Herr Dempwolf writes:

According to the analyses of Von Bibra, Meyer, and others, the nitrogen and ashy contents of the wheat vary according to the season, and the quality and condition of the soil. Thus the proportion of nitrogen varies between 1.88 and 2.729 per cent, the ashy contents between 1.4 and 2.218 per cent. In the same way the composition of the ashy contents differs greatly, since in some cases no nitrate is to be found, while in others almost one-half of the potash is represented by nitrate. The same is true of the lime and magnesia contents. Phosphoric acid appears to be the ingredient least subject to difference, as this varies but slightly.

Much as the properties of wheat and the products obtained therefrom have been examined, I have never yet found an analysis of the complete flour produce of this grain.

On the suggestion of Baron Von Liebig, who very kindly placed the necessary materials at my disposal, I undertook an investigation of the flour and other products of the Pester Walzmuehle.

According to the statement of the Directors, fourteen different products are obtained out of wheat at the Pester Walzmuehle, and that which furnished the material for my investigation was composed two-thirds of Theiss and one-third of Banat wheat. The analysis of the same showed:

Water.....	10.511 per cent
Ashy contents.....	1.505 "
Nitrogen.....	2.239 "
Starch.....	65.408 "

\*When dried at 100 deg., 2.503 per cent.

Proceeding upon the assumption that gluten contains 15.6 per cent of nitrogen, it would seem that there is of gluten in common grain 14.352, and in grain dried at 100 deg., 16.044 per cent.

As then the composition of the grain shows:

Water.....	10.511
Ashy contents.....	1.505
Gluten.....	14.352
Starch.....	65.408
There remains for fibre.....	8.225

Woody fibre was found to the extent of 7.144 per cent. Sugar could not be directly detected.

When the wheat grain is examined by means of the microscope, three chief component parts are easily distinguishable, the first of which is the pericarpium or shell, the end of which is covered with a tuft of small hairs. This does not appear to be of cellular structure on the outer part, but contains within a series of little cells. Then follows a series of large cells, the perisperm or albumine portion; in this, however, no starchy flour is to be found. The innermost part is filled with large starch-holding cells, increasing in density towards the exterior.

When the wheat-corn is ground, the softest parts (the innermost portion) are first ground, and these give the whitest and softest flour. The other kinds get darker and darker, accordingly as they are obtained in a greater or less degree from the harder and colored portions of the grain. The outermost shells are separated as bran, since their toughness renders a complete grinding impossible.

Before the corn is ground, the very outside parts, such as hair, shoots, root fibres, and a portion of the outer husks, are removed as being rubbish and tallings. Out of the wheat so prepared are obtained groats (A and B), superfine flour (Nos. 000, 00, 0 and 1), fine flour (Nos. 2 and 3), bread flour (Nos. 4 and 5), dark flour (No. 6), and bran (Nos. 7 and 8). As far as possible the flour is ground by means of rollers, and the remainder, which resists the action of the rollers, is ground by millstones.

The percentage of the product is as follows:

Groats and superfine flour.....	18.724
Fine flour.....	32.632
Bread flour.....	22.224
Dark flour.....	3.576
Bran.....	18.516
Waste.....	1.290
Dust, etc.....	2.088

In each 100 parts of flour are contained:

No.	Water.	Ashy contents.	Nitrogen flour dried at 100 deg.	Nitrogen in un-dried flour.	Starch.
A.....	11.050	0.398	2.080	1.858	69.983
B.....	11.545	0.386	1.874	1.658	69.830
000.....	11.077	0.380	2.011	1.808	72.145
00.....	10.618	0.416	2.071	1.851	71.017
0.....	10.492	0.452	2.087	1.868	68.867
1.....	10.142	0.481	2.122	1.907	68.866
2.....	10.421	0.580	2.212	1.981	67.302
3.....	10.544	0.611	2.435	2.178	67.176
4.....	10.748	0.764	2.611	2.329	65.631
5.....	10.674	1.176	2.788	2.491	61.773
6.....	9.427	1.549	2.570	2.325	61.031
7.....	10.690	5.240	2.518	2.249	45.838
8.....	11.159	5.690	2.513	2.233	41.453
9.....	9.235	2.048	2.616	2.375	Nil.

An examination was further made of a sample of flour which contained all the bran, and the composition of which was almost identical with that of the underground grain. There were found:

Water.....	10.743 per cent
Nitrogen.....	2.508 "
Starch.....	64.475 "
Ashy contents.....	1.503 "

Another sample of flour made from the entire grain, but from which bran had been separated to

the extent of 13 per cent, showed the following composition:

Water.....	10.548 per cent
Nitrogen.....	2.518 "
Starch.....	65.660 "
Ashy contents.....	1.032 "

If the analyses are compared, it will be found that the coarser the flour becomes, the more considerable is the increase of ashy contents, and (in almost the same proportion) the decrease of lime and potash contents, and the increase of magnesia. Nitrogen increases up to the bread-flour qualities, and decreases again in bran,—the greatest difference, however, is but 0.8 per cent. The water contents show but slight variations, and the grain is to be considered as well dried, otherwise the analyses would in most cases show more water.

Thus far Herr Dempwolf. Of especial interest, however, is the note appended to the end of the essay by Baron Von Liebig, which runs as follows:

"I am indebted to the kindness of the Directors of Pester Walzmuehle for the materials for this investigation, which was prosecuted in my laboratory by Herr Dempwolf (then my assistant), as also for the very interesting statement respecting the yield of the different flour products, as ascertained by the grinding of one hundred grains received in the course of a year's operations. I owe to the Directors of the Pester Walzmuehle my best thanks for their information and assistance in this investigation, which has afforded an opportunity of ascertaining the distribution of the component parts of corn on its being turned into flour. The analyses show that the flour products of the Pester Walzmuehle occupy the first rank in respect to their nutritious qualities; they are of the greatest fineness; all by far surpass in bread-yielding qualities and other descriptions of flour which have ever come under my notice."

## THE INCOMING COMMISSIONER OF PATENTS.

The newly appointed Commissioner of Patents, Gen. Halbert E. Paine, brings to his delicate and responsible position an excellent record for capacity and efficiency.

General Paine comes of honorable stock; and from the days when his grandfather thrice removed fought in the old colonial wars, down to the present, there have not lacked men of his name who have served their country in the field and in responsible places in civil life. Born in 1826, he was graduated at the Western Reserve College at the head of his class in 1845, and admitted to the bar four years later. His military title was won by hard service in the war of the rebellion. Subsequently he was elected to Congress; first to the thirty-ninth, again to the fortieth, and yet again to the forty-first. In his Congressional service the high reputation he had won in the army for sterling capacity and integrity in the conduct of affairs was admirably sustained. He was at the head of the Committee on Militia, served on the Committee on Reconstruction during its whole existence, and was successively member and Chairman of the Committee on Elections, in which onerous and difficult position he compelled the admiration of political opponents as well as party friends. To him is credited also the perfection and passage of the Signal Service Act.

At the expiration of the Forty-first Congress, General Paine refused to stand again, preferring to return to the practice of his profession. He established himself at Washington, where he has since resided. A short time since he was offered the post of Assistant Secretary of the Interior, but declined. His acceptance of the Commissionership of Patents will, we trust, prove eminently satisfactory to himself and to the country.

Touching his plan of action in the new field, General Paine lately declined to speak further than to say that he had given the subject some thought and viewed his approaching duties without apprehension. He knew the position to be an arduous one to fill, furnishing work enough to keep the most ambitious incumbent busy; the arrangement of details he would leave to the observation and conclusions of occupancy. In view of General Paine's long acquaintance and professional association with the Secretary of the Interior, it is believed that his appointment will prove advantageous to the Patent Office, in insuring perfect harmony between it and the ruling department. Inventors, and all likely to have business to do with the Patent Office, will be pleased to know that promptness and thoroughness will characterize the working of the office under the new rule.—Scientific American.

A Virginian writes in praise of corn, not only as the best food for laboring men, but for domestic animals of all kinds. He states that the usual rations for a negro laborer, for a week, is one and a half pecks of corn, three pounds of bacon and a little molasses. They thrive on it and are healthy and strong. Southern horses and mules, as a rule, have only corn for grain, but they live longer and do more work than northern horses that feed on oats. In this part of the country dogs are fed almost exclusively on corn meal, and they not unfrequently eat corn in the ear, while wandering curs devour it on the stalk. Even cats eat corn meal stirred up with water, as is done in the case of chicken feed.

Mr. A. Kellogg, of Wrightstown, Wis., has put into his new grist mill a 45 horse power upright engine and will soon have in another run of stone, making three in all. Mr. Kellogg is also one of the proprietors of the new mill at Fort Howard, Wis.



## EVERYBODY READS THIS.

## NEWS OF THE WORLD.

## Items Gathered from Correspondents, Telegrams and Exchanges.

## CROP ITEMS—MILLING AND MANUFACTURING ITEMS—FINANCIAL ITEMS—CASUALTIES—ETC., ETC., ETC.

Reubens, Kan., has a fine new flour mill.

The Litchfield, Minn., mill is running on full time.

The mills at Depere, Wis., are all doing a good business.

The mill at Grantsburgh, Wis., is running day and night.

The new mill at Windom, Minn., started up on the 12th inst.

A new grist mill is to be built about a mile east of Trenton, Wis.

Ellsworth, Kan., has three grain elevators and one flour mill.

Ed. Paulson is building a large feed mill at Albert Lea, Minn.

The new mill at Montgomery, Minn., will soon be in running order.

W. C. Easler is to take charge of the grist mill at Beaver Falls, Minn.

Stephens & Bailor's mill at Osaka, Minn., is crowded with work.

Mr. Leaver's mill at Greenleaf, Minn., is hereafter to be run by steam.

Mr. Swanson's new mill at North Branch, Isanti Co., Minn., is nearly finished.

Paul Munch, of Franconia, Wis., is erecting another addition to his grist mill.

Mr. N. E. Brown, of Cedar Rapids, Ia., has been making some repairs in his mill.

Geo. Harshman's distillery at Harshmanville, Ohio, burned. Loss \$18,000.

Water is low at Dundas, Minn. The Archibald mills run about ten hours a day.

Daniel F. Lombard, miller of South Windham, Me., has retired from business.

A Green Mountain water wheel is the latest addition to the mill at Kingston, Minn.

J. T. Maybury & Co's flouring mill at New Orleans, La., burned. Loss \$25,000.

Edward Thompson, of Hokah, Minn., has been getting up a diamond stone dresser.

The brick work on Mr. Hubbard's new mill at Mankato, Minn., is nearly completed.

The steam flouring mill at Shakopee, Scott Co., Minn., is fast approaching completion.

Dickson, Easton & Co's mill at Chatfield, Minn., has recently been thoroughly repaired.

Diamond & Reiser's flouring mill at Sister Bay, Door Co., Wis., is now in full operation.

Mr. R. Thompson, of Menominee, Wis., has rented the Winger Mills at Martel, Wis.

H. A. Jewett is repairing the mill at Cedar Mills, Minn., and will soon have it ready to run.

Messrs. Nye, Yager & Co., of La Valle, Wis., have put a new run of stone in their mill.

Mr. Alden will soon have his flouring mill near Alexandria, Minn., inclosed and under roof.

The firm of Gardner & Moore, of Cannon Falls, Minn., is succeeded by Stephen Gardner.

The town of Monument, Col., offers a suitable site to any one who will put up a grist mill there.

F. D. Key, of Lake City, Minn., is rebuilding his flouring mill which was burned last summer.

F. Harke, of St. Peter, Minn., is building an addition to his mill to secure more storage room.

The Eldora, Ia., flouring mills have been thoroughly overhauled and are now at work again.

John T. Noye & Son have ordered Walker's Belt Tighteners for several of their milling patrons.

A two-run water power mill is to be built at once at Gary, Deuel Co., Dakota, by a Mr. Vicklin.

Shenke's flouring mill at Elk Point, Dakota, grinds 500 bushels of wheat every twenty-four hours.

The flouring mills of Lanesboro, Minn., which have been undergoing repairs, are again at work.

The boiler in the Bachellor's saw mill at Foreman, Mich., exploded. Jesse Foreman was killed.

B. D. Sprague, of Rushford, Minn., is shipping 1000 barrels of flour per week to eastern markets.

A large flouring mill is in operation at Mazatlan, Mexico, and grinds wheat imported from California.

Mr. E. Newman, a Janesville, Wis., miller, has gone to Fox Lake, Wis., to take charge of a mill there.

A substantial new frame dam is being put in at the Warner mill, on Dobbin's creek, near Austin, Minn.

It is reported that Mr. J. M. Vincent has purchased a half interest in the flouring mill at Taylor, Wis.

J. D. Smith got caught in a belt in the Eau Claire, Wis., saw mill Oct. 12, and was instantly killed.

A new grain elevator at Beloit, Kan., is nearly completed. The wheat receipts at that point are large.

M. H. Thomas & Sons' grist mill, at Galveston, Ind., burned October 23d. Loss \$9,000. No insurance.

The Thompson mill at Hokah, Minn., commenced work last week under the new management of S. C. White & Co.

Edward Thompson, of Hokah, Minn., has invented a diamond mill stone dresser, which is said to work perfectly.

The water was drawn off from the pond at Hudson, Wis., last week, to admit of some repairs at the Willow River mills.

S. Mackey & Co., of Reedsburg, Wis., have increased the force of their mills by engaging the services of a St. Louis miller.

The Edaile, Wis., mill company are making good progress with their new mill and dam which will be ready for next season's work.

A great conflagration in Riazan, a city of Russia, recently, destroyed property to the amount of 2,000,000 rubles, or about \$1,500,000.

Three hundred Icelanders emigrated to Canada during August, making 1,800 who have repaired thither during the past three years.

Nordyke & Marmon Co. of Indianapolis, Ind., have within the last six weeks shipped over fifteen of their improved 20-inch New Era mills.

During last month Nordyke & Marmon Co., of Indianapolis, Ind., have shipped nine complete 2 and 3-run mill-outfits to the State of Kansas.

E. J. May, of Lizton, Ind., is adopting the new process, and has ordered the necessary machinery of Nordyke & Marmon Co., of Indianapolis, Ind.

The baker who sings "Tell me where is fancy bread" has added "Good pie sweetheart, good pie" to his repertory. He kneaded another song badly.—*Figaro*

Nordyke & Marmon Co. of Indianapolis, Ind., are overhauling the mill at Elizabethtown, Ind., owned by Calvin Butler, and changing it to the new process.

William Chap's steam saw and flouring mill at Wallace, Mo., a few miles from Atchison, burned to the ground Oct. 21. The loss is \$2000; no insurance.

The Green Street Mills, at Richmond, Ind., are adopting the new process, and the machinery is being furnished by Nordyke & Marmon Co., of Indianapolis, Ind.

Arnold, Thomas & Co., of Huntingdon, Ind., are putting in a four-reel merchant mill, which is being furnished by Nordyke & Marmon Co., of Indianapolis, Ind.

Messrs. Meek & Bros., of Bonaparte, Ia., have contracted with the Richmond City Mill Works of Richmond, Ind., for a six-run mill complete, including water wheels.

S. H. Marten, of Milton Cabel Co., West Virginia, is putting in a 42 inch wheat burr, a two-run chest, etc., furnished by the Richmond City Mill Works, of Richmond, Ind.

New chilled iron rolls and new bolts have recently been put into the St. Croix mills at Stillwater, Minn., and there is some talk of building an elevator in connection with the mill.

Nunnemacher Co., of the Star Flour Mills, have ordered six pair of stone complete with iron husks, etc., and ten reel bolt chests, from Edw. P. Allis & Co., of the Reliance Works.

John B. A. Kern, of Milwaukee, has ordered two more of the Wegmann porcelain roller mills from Edw. P. Allis & Co. This makes eight of these machines that he has in all.

The New Free Press, of Vienna, complains that the export of Hungarian wheat is almost at a standstill, partly in consequence of the Americans underselling the Hungarian markets.

Jeffries Bros. of Cory, Ind., are making important additions to their mill and adopting new process machinery, which is being furnished by Nordyke & Marmon Co., Indianapolis, Ind.

Pierce & George, of Sulphur Springs, Tex., are building a two-run mill at that place. The Richmond City Mill Works, of Richmond, Ind., have the contract for bars and machinery.

Nordyke & Marmon Co.'s summer importation of their favorite reddish cream-colored French buhr stone arrived at Indianapolis, Ind., last week, and consisted of a train of fifteen cars.

Lewis Graham, Esq., of Alden, Minn., is enlarging his mill, and adding new buhrs and necessary machinery, all of which is furnished by Nordyke & Marmon Co., of Indianapolis, Ind.

Edw. P. Allis & Co., of Milwaukee, have received an order for four Wegmann patent porcelain roller mills, six purifiers, and one bran aspirator, from S. Harris & Co., Gault, Ontario, Canada.

Wm. Chap's steam saw and flouring mill at Wallace, Mo., was burned last Saturday afternoon. The fire is said to have originated from spontaneous combustion. Loss, \$2000, with no insurance.

J. W. Gordon of Litchfield, Minn., and his brother, W. B. Gordon, who has just finished his apprenticeship in the Forest City mill, have leased the Carville mill in East Kingston, Minn.

J. D. Ball & Co.'s large flouring mill at Ballville, Ohio, was totally destroyed by fire on the morning of Oct. 20; 5,000 bushels of wheat were stored in the mill. Loss, \$28,000. Insurance, \$7800.

Alfred Huntington, formerly head miller at the Empire Mills, Milwaukee, has recently purchased in partnership with Mr. Koch, the mill at Barton, Wis. The firm is known as Huntington & Koch.

It is estimated that the barley crop will fall short of the demand in this country to the amount of 10-400,000 bushels. The crop reports indicate an unusual shortage both in this country and in Europe.

Messrs. Vance, Parrott & Co. recently commenced building a fine 3-run flouring mill at Pierce City, Mo. The entire machinery will be purchased of Nordyke & Marmon Co., of Indianapolis, Ind.

The Atlas Engine Works, Indianapolis, have contracted with Isaac Staples, Stillwater, Minn., for one of their 18 x 48 Atlas-Corliss condensing engines, with a battery of steel boilers, to be delivered Dec. 1.

Cawker City, Kan., advertises for some one to locate a steam grist mill there. For further particulars address Mayor W. C. Whitney, Cawker City, Kan. Here is a good chance to make money for some one.

Messrs. Settle & Burnley, of Woodville, Ky., have ordered of the Nordyke & Marmon Co., of Indianapolis, Ind., a 3-run mill and engine, with modern improvements, all of which is under construction.

M. L. Strickland, of New Marion, Ind., is putting in purifiers and otherwise fitting up his mill for the manufacture of new process flour. The machinery is being furnished by Nordyke & Marmon Co., of Indianapolis, Ind.

A concession has been granted for the laying of a railroad from Jaffa to Jerusalem, and for the construction of a harbor for ships at the former place.

Gen. Mott, of the United States army is actively engaged in this enterprise.

The City of Glasgow Bank has failed. Liabilities said to be nearly \$50,000,000. One London East India house has failed for \$15,000,000, and other great and many small failures in Great Britain and her colonies are sure to rapidly follow.

Wm. Cook, of Harvard, Neb., is building a 2-run water mill, which is being manufactured by Nordyke & Marmon Co., of Indianapolis, Ind., which makes the sixth mill outfit furnished by this firm during the last few months in Nebraska.

Messrs. Kellogg & Son have completed their new mill at Fort Howard, Wis., and are now at work. The mill has one run of stone for flour and one for corn and feed. The machinery is all of the latest make and the flour turned out is good.

Edw. P. Allis & Co. have completed the Niagara Mill, which they have been building for Messrs. Schnellkopf & Mathews, of Buffalo, N. Y., and it is pronounced by all who have seen it as the finest mill in the United States, if not in the world.

At the Coliseum Theater in Liverpool, Eng., on the night of Oct. 12, a cry of fire was raised, which caused a general stampede for the doors, in which thirty-seven persons were crushed or suffocated, many of them being strong, able bodied men.

Orlando Furnas, of Edinburg, Ind., is tearing out and remodeling his mill, and with the large amount of improved machinery ordered of Nordyke & Marmon Co., of Indianapolis, Ind., intends to make it one of the best new process mills in the State.

With respect to the present rice crop in Louisiana it is estimated that it will be the largest yet made in that State, and that the quality shows an improvement on previous crops. Present estimates place the yield at between 175,000 and 200,000 barrels.

Special telegram from Clinton, Mo., to the Sedalia Democrat dated Oct. 9th, reported the burning of Messrs. Riehl & Brannan's Tebo Mills and elevator, and the destruction of 22 bushels of wheat, and 100,000 barrels of flour. The loss is estimated at \$20,000.

A new style of crane has been fitted to the Eau Claire Lumber company's grist mill for the purpose of raising the upper stone when necessary. The improvement consists in carrying the chain round a pulley, and attaching it to a horizontal screw, instead of a vertical crank, as formerly.

John W. Benham & Co., of Pontiac, Ill., have ordered of Nordyke & Marmon Co., of Indianapolis, Ind., machinery for a first-class 4-run new process merchant mill, including a 60-horse-power engine. The machinery will be located in the building by Nordyke & Marmon Co.'s millwright.

At the county fair held at Portage, Columbia Co., Wis., the first premium for winter wheat flour was awarded to George D. Dates & Co., of Fort Winnebago, and the second to John McKenzie, of DeKorra. On spring wheat flour Mr. McKenzie took the first premium and Dates & Co. the second.

A new elevator is to be built immediately by Bowercock & Co., on the south side of the Santa Fe track, directly opposite the Douglas County Mills. The capacity of the new building will be 50,000 bushels, and the machinery will be of the latest and most improved style.—*Lawrence (Kan.) Journal*.

S. H. Bradley, of Mendon, Ill., who recently had their mill changed to the new process by Nordyke & Marmon Co. of Indianapolis, Ind., writes us that they are running eighteen hours per day, and are having heavy orders for their much improved grades of flour. They recently shipped 1000 barrels to Scotland.

During the last month the machinery for the large, handsome new process mill of Brown Bros., at Evanville, Ind., is being located by J. C. Bare, with a large force of workmen. This mill promises to be one of the finest and best in that part of the country, and every one looks forward to the time when it will be in full operation.

Messrs. Hudnut & Co., of Terre Haute, Ind., operators of the large honing mills, have added four portable mills and other machinery for increasing their capacity, all of which is furnished by Nordyke & Marmon Co., Indianapolis, Ind.; also J. B. Harris, Adams & Creal, and I. J. Bolton, all of same place, are fixing up their mills.

The work on the Washburn A mill progresses, the excavation having been about completed. The immensity of the structure which is to supplant the old big mill is already in a measure outlined, and it is clear that the reconstructed mill will cast its famous predecessor into the everlasting shades so far as proportions are concerned.—*Minneapolis Tribune*.

In the little city of Cohoes, N. Y., there are 20 knitting mills, whose combined production reaches upward of \$20,000,000 in value. The production is almost exclusively confined to underwear—shirts and drawers. One of the largest establishments is that of the "Diamond Knitting Mills," of Messrs. Hines & Vail, who employ 200 skilled operatives, and turn out annually over 22,000 dozen shirts and drawers.

One of the largest and best appointed oatmeal mills in the country is the North Star Mills, of Messrs. Stuart & Douglas, Cedar Rapids, Iowa. Though having a capacity of 600 barrels of oatmeal per day, so popular has their brand become, and so thoroughly has the public taste been cultivated for oatmeal by the excellence of the article, the North Star Mills are kept constantly running to their full capacity to meet the demand.

The San Francisco Call speaks of the California wheat crop as follows: The total is certainly enormous. Allowing 10,000,000 bushels for seed and home consumption, the table shows a surplus of nearly 1,000,000 tons. This may be in excess of the ultimate yield, but a careful analysis of the statement warrants the expectation of at least 750,000 tons surplus, even should the yield in the worst counties fall to bottom estimates.

On the Northern Central Railroad of Pennsylvania, recently, Engine No. 40, driven by Robert Burgeon, with Conductor Jarvis in charge of the train, drew from Clark's Ferry to Sunbury, a distance of thirty-one miles, a train consisting of 183 empty freight cars, one loaded eight-wheeler, two cabooses and a dead engine. It was up-grade work, but the trip was made at the rate of ten miles an hour. The train was 6200 feet long, or 920 feet more than a mile, and, it is claimed, was the longest ever drawn by a single engine.

There is a farm in Dakota in which a Boston man is interested, which has 18,000 acres of ground in wheat this year, and yielded 325,000 bushels, worth \$300,000, more than one-half of which is said to be the profit. The intention of the owners of the farm is that the acreage and product shall eventually be trebled. When a million dollars in gold or silver is dug from the earth, there is great rejoicing, and men and women go wild for stocks in the mines, but the gain from such a farm as this is more valuable to the country, and attracts far less attention.

Not a year, indeed hardly a month, passes but a shark spoils a British ship of one or more of her hands. While the vessel is in the harbor, or riding in the offing, a man tumbles overboard, or is captured from a boat, or attempts to swim ashore, and is torn in pieces by sharks within sight of help and sound of human voice. The Alice Davies, of Liverpool, has just returned to the Mersey, and in her "log" is duly recorded a terrible catastrophe of this kind. She was anchored off a small river known as the Probotingo, on the coast of Java, and one of her crew, a Welshman, of the name of Owen, went with four others to bathe. They were all good swimmers, and Owen, who was the most skillful, had ventured some little distance from the vessel, when he was suddenly heard to utter a piercing shriek. A large shark, rising suddenly from the bottom, had bitten him immediately below the fifth rib, and literally torn him to pieces. A rope was thrown to him, but his injuries were so terrible that he immediately sank. His companions escaped uninjured, but of Owen's body no trace was recovered. The shark which attacked him was, we are told, judged to be fifteen feet in length. Such dimensions, although large, are yet not unusual in the Javanese Seas.

The shark is not so much the tiger as the vulture of the sea. Like the vulture, he hesitates to attack anything with life in it; but, if hungry, becomes for the time possessed with a courage not his own. We shall never exterminate him, and his presence in tropical waters must always remain a constant source of danger. Meantime he has at least this merit, that wherever he may be found he affords a certain rough species of sport. There is no better fun than fishing for a shark with a hook the size of a pitchfork, and a huge piece of pork by way of bait. Harpooning the creature is also an exciting amusement, although seldom practiced. Of late years, too, the shark has been hunted in novel and scientific ways. There is no better form of rifle practice than to shoot at him from over the stern, with explosive bullets. If you miss him he still follows on. If he is hit, a great hole is rent in him. He rolls slowly over on his back, displaying his cruel, gaping jaws and vast expanse of white under-surface, and his brother sharks, coming up from around, quarrel and dispute fraternally over the carcass. Best, however, of all modes of shark chase, because most scientific, and consequently most amusing, is that recently adopted in her Majesty's navy of combining torpedo drill with shark fishery. A miniature torpedo is inclosed in a bait of junk or pork, and lowered with proper care. The battery is duly charged, and at the moment that the huge fish seizes, and as a pike fisher would say, "pouches" the tempting morsel, the circuit is completed. The effect is instantaneous. The head and jaws of the monster are blown into fragments, and a bubbling circle in the water marks the spot where, a few seconds before, his dorsal fin was showing above the waves.

HOW TO FILE AND SET A HAND-SAW.

When a saw is in bad order, the teeth are irregular in length and pitch. This occurs through improper filing, and results in the saw working hard. The reason is that a saw irregularly filed, or set, cuts only with the longest teeth and those that have the most set. To remedy these defects, it should be pointed and filed until the teeth are all of even length, and are pitched so that the front of each tooth is at right angles with the back of the saw. The saw is fastened into a clamp, which consists of a pair of jaws fixed upon a stand, and moved by screws. The ends of the teeth are brought to a level by running a flat file lengthwise of the blade. The best form to give the edge is a slight curve from end to end of the saw, making the middle slightly rounding outward, never hollow.

The handle of the saw when in the clamp should be to the left, and not be changed during the filing. The part held in the clamp should be filed completely before being moved, if the jaws are not long enough to hold the whole. On a rip-saw, the teeth will be filed square on a cross-cut, they are beveled upon alternate sides. Both sides should be filed without moving the saw, which may be done by changing the position and manner of holding the file. A beginner should provide a handle at least a foot long for his file; this will enable him to hold it steadily, which is very necessary for good work. The proper size for a file is 3½ inches long for a saw having eight teeth to the inch. A saw is set before it is filed. The set given for easy cutting should be such as to make the cut as wide as twice the thickness of the blade.

Several good sets are sold at the tool shops which are self-regulating, and make even work. If only a few of the teeth are short, they need not be pointed, but may be touched with a few strokes at each filing, until the rest are worn down to them. If one has no clamp, a strip of hard wood may be laid upon each side of the saw, and the whole held tightly in a vice. In filing, the strokes should be made from the operator and not towards him. The file should be grasped firmly in the right hand, while the tip is held lightly between the finger and thumb of the other. A safe rule is to work slowly, and to test the teeth as the work progresses with a try square. As long as the faces are kept at right angles with blade of the saw, the backs must come out right.



## EDISON'S NEW LIGHT.

Mr. Edison came clattering down the stairs, glowing with a pleasant excitement and evidently just emerged from his wizard's caves. "Hello, is it you?" he said rapidly. "In a week or two I'll have my electric light ready for you to illustrate, if you care to do so." "You seem to be making a panic among the gas companies," said the *Graphic*. "Well, yes; those old fellows know what they are about. I've got 'em certain, and they are finding it out." "Is there really any good cause for this sudden tumble of gas stocks?" "It is a little precipitate, perhaps, but it was bound to come. The electric light is the light of the future—and it will be my light—unless," he added, with a conciliatory twinkle, "some other fellow gets up a better one. Still, the gas stocks need not decline. The companies can just adopt electricity instead of gas and run our wires instead of their pipes."

He led the way up stairs again, to the second floor of the laboratory, and paused before the bench where he first hit on the phonograph, and where he finished his telephone. Three small brass standards were there, six or eight inches high, each with a small glass globe or cylinder at the top, enclosing a curious nest of wires. From each standard a wire descended through the floor. "These are the lamps," said the inventor, relighting the pipe which had gone out, and laying it on the bench, where it immediately perished again. He touched a lever on the bench. "Now the current is on this lamp," he explained, touching the smallest; "it is lighted, but you do not yet see it." Presently the nest of wire at the top assumed a dull crimson glow. In another minute it was scarlet; then it turned to a fierce white heat. "Of course, there is no flame," he said; "the light is wholly from incandescence. That light is just about equal to one gas jet. I can increase or diminish to any extent. I can regulate it with mathematical accuracy." "What is that wire that glows?" "That is platinum." "How long will it last?" "Forever, almost. It will not burn. It never oxidizes." Then he turned it down through all shades of red, till the light vanished. "You do not see it now," he said; "but it is lighted. It is invisible, and the electricity required is almost infinitely small, but it is there, and a touch will recall it—see!" and he tapped the lever and the illumination returned. "How's that for a sick room?" he asked with a broad smile of pleasure. He connected the circuit with two other lamps and showed their different patterns and capacities. Then he explained the peculiarity which rendered this electric light practicable and valuable. "Where does this electricity come from?" he was asked. "Down stairs. It is furnished by our engine. We use Wallace's machine—William Wallace, of Ansonia, a wonderfully ingenious man. We use his generator. It simply turns power into gas. In actual operation, one large engine would supply a whole town with light." "How much will your lights cost, Mr. Edison?" "They'll cost a good deal less than gas. How much less is not now certain, nor is it prudent to estimate it."

We returned to the electric lamps. "You light one of these," said Edison, "by just turning a thumbscrew. No lighting of matches, no fumes, no danger of suffocation or damage if you leave it turned on full." We followed him to the back window, where he called our attention to groups of workmen digging, and said, "I am putting up a new building there to perfect this electric light. It will be 135 by 35 feet, and will be equipped with two eighty-horse power engines, an immense hydraulic press, and much other machinery. We are going to put electric lights all over Menlo Park, and see how many one-horse power will feed. We want to know exactly all about it." The return train whistled unexpectedly, and the visitors rushed down across the field, followed by the warning voice of the Wizard, who shouted from the porch, "Don't give me away—till next week!"—*N. Y. Graphic*.

## BRUDDER JONES REPROVED.

THE FOLLY OF PUTTING ON STYLE ON A SMALL FOUNDATION.

"We doan' 'speak to fin' parfoeshun in human natur," began Brother Gardner, as the Lime-Kiln Club came to order. "We realize dat it am human to take de wrong street kyar once in a while, an' dat none of us kin predict de wedder straight from de shoulder an' nebbber miss a hailstone. Nebb'rdeless, de true man will praise whar' it am justified, an' criticise whar' it am needed, an' now Brudder Horseradish Shortcake Jones will please an' stan' up."

The brother, who resides on Watson street, was so surprised and amazed that he could hardly reach his feet. He had no suspicion that anything was coming, and his elbows trembled as he felt in his vest pockets for some watermelon seeds to brace his nerves.

"Brudder Jones, you were in de Poss Office last Tuesday an' Wednesday an' Thursday, 'bout 10 o'clock in de forenoon?"

"So I was," replied Jones.

"You had on a caliker shirt, a big stan'-up collar, long cuffs, an' you car'ied a cane an' walked wid de moshun of de biggest giraffe in de show. I saw you dar, Brudder Jones, an' dar kin be no mistake. It pained my heart to see you swellin' 'round in dat style, when I knowed dat you hadn't \$5 in de world; but swellin' 'round wasn't 'nuff for you. You waited till a crowd had kerlected at de general delivery winder, an' den you pushed in an' called out: 'Am der a letter heah fur me from Noo Yawk wid a tree hundred check in it?' You played dat game free days runnin', 'speakin' dat de crowd would take you fur de man who owns de City Hall. What has you to say, Brudder Jones?"

"Nuffin', sah. Ize mighty sorry, sah, dat I made such a fool of myself."

"So am I, Brudder Jones," kase de members of dis club has de general reputashun of bein' purty level on top de head. Now let me say to you dat all de time you was inquirin' for dat check from New York I could see your hind patches, yer boots run down at de heels, a hungry look 'roun' yer mouth, an' such a spreshun in yer eyes as belongs to de chap who am dodging his washerman. All de older folks saw de same fings, an' dey laffed at you for pewterhead."

"I hopes I won't be frown outer de club, sah," replied the culprit.

"You am not on trial, Brudder Jones, I bring dis case up for your own good, an' to warn you dat de man who swells 'round under false colors am simply runnin' a race wid a fool. Be satisfied to be what you am an' nuffin' more. If you git a check of free hundred dollars from Noo Yawk, put it in yer vest pocket an' doan' emagine dat it's de fast check eber known. I doan' keer how well you dress, but take notiss dat de pussun who wars a stan' up collar shouldn't war black patches on ash-color'd pants at de same time. Kid gloves am all right, but dey doan' go well wid a pa'r of 50-cent bates. Long cuffs am a werry useful article o' commerce, but when dey trabble 'long wid a coat split out at de elbows de public will make remarks. Dat's all. Brudder Jones, take yer seat an' permit de reg'lar purceedin's to purceed."—*Free Press*.

## NOVEL PLAN FOR A MILL.

At the Mechanics' Fair in San Francisco, Cal., Mr. D. Bequette, a practical miller and millwright, had a plan for a flouring mill which is a wide departure from those upon which mills are generally constructed. His plan provides for the structure of a building which in general outline is like that of a pyramid, each story as it rises above the other, contracting its dimensions. The mill built on Mr. Bequette's plan would be a structure 130 square feet at the base, covering a superficial area of 16,900 feet. It would consist of eight floors, forming an aggregate elevation of 110 feet. The first and second floors of a flouring are always crowded more than those above them, the demand for space diminishing with each ascending story. According to Mr. Bequette's plan, the first or stone floor would be 130 feet square, the second 110 feet square, the third 90 feet, the fourth 70 feet, and the fifth 50 feet square. The three upper stories would each be 30 feet square, and on the apex of this pyramidal structure Mr. Bequette would place a water tank. The building is so designed that the roof forms the principal part of the sides, bracing the structure and giving it strength. On each floor a slanting roof rises from the outer edge of the flooring to the middle of the pillars sustaining the outer edge of the floor above. In this way, the upper half of the side of each floor is open and the lower half is wedge-shaped. With the exception of the roofing, the building is to be built of pillars, beams and flooring, and is practically without walls. The openings in the sides furnish abundance of ventilation for each floor, in order to prevent the accumulation of fine dust. With the aid of French tile, Mr. Bequette says that a mill could be constructed entirely fire-proof, the pillars, girders, flooring, etc., being made of iron. The power of the mill would be located in the basement, and would be transmitted to the upper stories by means of an upright shaft. Mr. Bequette would utilize the wedge-shaped sections under the roof of each floor

for the storage of screenings into hanging hoppers beneath. Mr. Bequette estimates the cost of a structure of this kind at only \$15,000.

**WHAT OATMEAL DOES.**—Liebig has shown that oatmeal is almost as nutritious as the very best English beef, and that it is richer than wheaten bread in the elements that go to form and muscle. Prof. Forbes of Edinburgh, during some twenty years, measured the breadth and height, and also tested the strength of both the arms and loins of the students in the university—a very numerous class, and of various nationalities, drawn to Edinburgh by the fame of his teaching. He found that in height, breadth of chest and shoulders, and strength of arms and loins, the Belgians were at the bottom of the list; a little above them, the French; very much higher, the English; and highest of all, the Scotch and Scotch-Irish from Ulster, who, like the natives of Scotland, are fed in their early years with at least one meal a day of good oatmeal porridge. Speaking of oatmeal, an exchange remarks that a very good drink is made by putting about two spoons of the meal into a tumbler of water. The Western hunters and trappers consider it the best of drinks, as it is at once nourishing, unstimulating, and satisfying.

**HIS EAR IN HIS POCKET.**—The Oil City Derrick relates the following: Yesterday a small boy with his head bandaged entered a bookstore and said he wanted to buy some school-books. As the clerk was waiting on him he inquired the reason his customer's head was tied up in such a shape.

"Oh," responded the boy, in a matter-of-fact way, "a horse bit off my ear this morning."

"No!" said the clerk doubtfully; "what was the trouble, anyway?"

"I tell you he did bite it off," the lad said, with some warmth, "and I can prove it, too. Just you look here now," and reaching down into his pocket he drew forth a wad of newspaper soaked with blood and slapped it down on the counter. A crowd formed around the little fellow, who with great gravity and a pardonable air of triumph proceeded to unwrap the unsavory mass. Then he pulled forth a ghastly relic in the shape of a human ear, evidently torn out by the roots. "There, didn't I tell you so?" he cried, exultingly. "He fetched it off at the first nip." The boy gave his name as Eagan, and said he lived on the Clapp farm. While working in the barn the horse reached his head over the side of the stall, caught the little fellows ear in his teeth and chewed it off. Having thus delivered himself, the lad carefully rewrapped his precious ear, thrust it in his pocket and departed.

**PRETTY COTTON-PICKERS.**—Not unfrequently young ladies, whose fathers and brothers or their laborers happen to be hard pressed with work, go into the fields and lend a helping hand. Among the latter class—is a young lady—the 15-year-old daughter of one of the oldest and most respected families on the Brazos—whom the correspondent met at the mansion of her father near Pattison. The conversation naturally turned on cotton-picking. The young Texan girl, blooming with youth, her dark hair floating over her fair forehead, matching her large dark eyes, that flashed at intervals, proceeded in her girlish way to give him all the information about cotton-picking desired.

"The most of my father's hands pick 150 to 200 pounds a day," she said.

"That seems excellent work," replied the correspondent.

She laughed, and her eyes flashed. "Why, I can do almost that well myself, and I am not used to it. I have gone out in pa's field and picked 150 pounds in a day."

"Didn't the sun burn your face to a crackling?"

"Why, no; I just put on this long sun-bonnet (exhibiting it) and a pair of gloves, with my fingers out at the top."—*Texas Letter to St. Louis Globe*.

An accident occurred recently at Stewart's mills, which might have proved fatal. The saw in the east mill was running through a large log, when some part of the feed works got out of order, and quicker than a flash the carriage was reversed, and the sawyer having no control over it, it was sent like an arrow out of the mill into the pond. The two men who were riding the carriage had a narrow escape, but fortunately escaped uninjured. It took nearly a day to repair damages.—*Wausau (Wis.) Pilot*.

Colorado wheat crop averaged from 25 to 30 bushels to the acre.

## YELLOW FEVER AND NEW ORLEANS TRADE.

The trade of New Orleans has suffered much by the yellow fever. The *Price Current* of that city of Oct. 9th says: "The present stagnation in all business is fully illustrated by a glance at our copious tables of receipts and exports which we give on our seventh page. It will there be seen that with the exception of wheat, rice and molasses, our shipments, consequent upon quarantine restriction, have been less than for the same period last year by such vast amounts, that the figures for the present season bear no comparison at all to those of the year previous. The receipts also indicate plainly what trade has been lost to New Orleans on account of the epidemic. We find that we have received since September 1st more dry salted meats, more rice, wheat and pork than for the corresponding period of last year; but most other articles, which go to fill the country demand for groceries, and other things of every day necessity, show an unprecedented falling off, even of our own country produce, such as hides, wool, moss, eggs, etc., which in the aggregate give employment to quite a number of persons. The arrivals have dwindled down to a mere speck, showing conclusively that the small as well as the larger industries have all been arrested in their regular occupations, creating suffering and want among our own people as well as among the country producers." There has also been a heavy falling off in the business of Memphis, Vicksburg, and in fact the whole fever district of the South. Thus to a large extent may be ascribed the dullness of the provision market the past two months and quietude in the produce market in St. Louis of which its merchants have been complaining.

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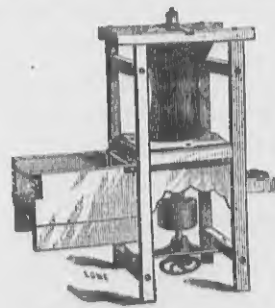
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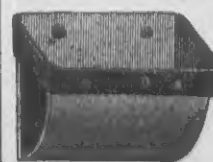
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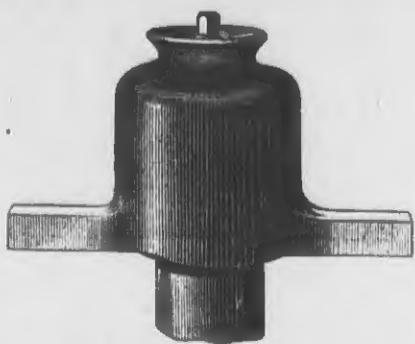


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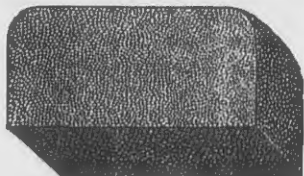
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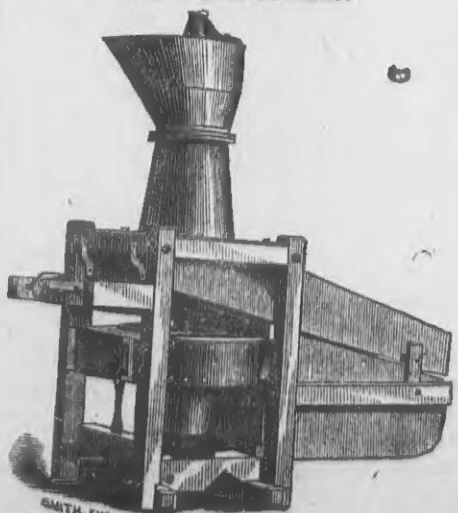


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We have used the Becker Wheat Brush now for over a year and we are very much pleased with it. It runs light, does its work thoroughly, and is entirely satisfactory to us. I am now convinced that it is one of the best machines made in the country, for the purpose. Very truly, GEORGE BAIN, President Atlantic Milling Co., St. Louis, Mo., Sept. 27, 1878.

Your Becker Wheat Brush Machine does the work well, is easy on power, and gives our miller little or no trouble. Have never seen a better machine; its work is beautiful; don't see how anything better can be wanted. HENRY C. YEAGER, President Yeager Mill Co., St. Louis, Mo.

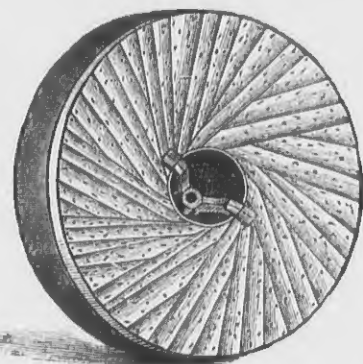
We consider the Becker Wheat Brush equal in cleaning capacity to all the balance of our other cleaning machines, and are entirely satisfied with it. GALLATIN MILLS, Gallatin, Tenn.

We must say that the Becker Brush suits us better from the very start than any other machine we have ever put in; it gave us the least trouble to get started and adjusted. In fact it gave us no trouble at all; but has done splendid work from the start. Our wheat is now much better cleaned than before. In regard to power required, can only say that the reason we had not put in a Brush long ago was that we thought we had not the power to spare to drive it, but now that we have got it, our engineer says he can see no difference in steam or fuel. Previous to using your Brush, we had frequent complaints that our flour was dark. Since starting it we have not had a complaint, so we feel confident it is doing us good in that way, as well as saving wheat in screenings. There may be better machines than yours but we have not seen them. OLIVER & BACON, Erie, Penn.

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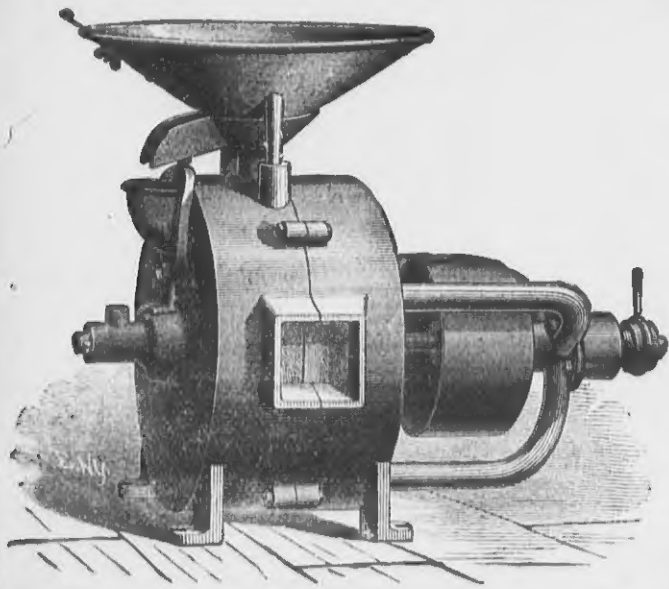
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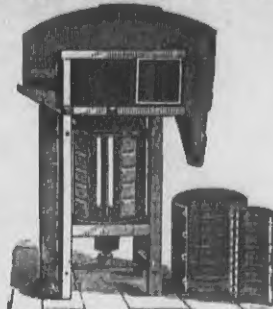
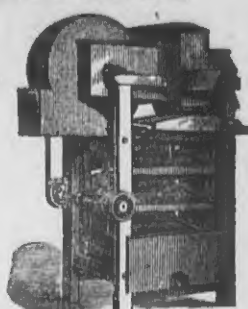
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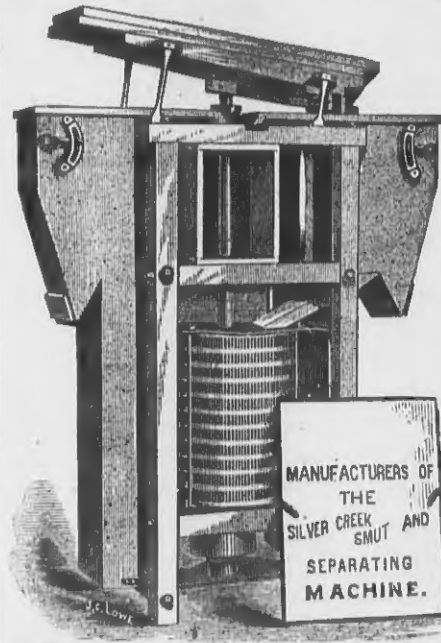
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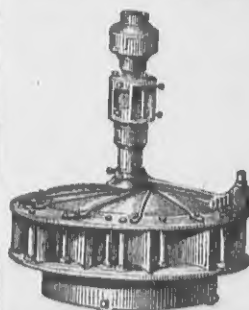
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